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PHARMACEUTICE RATIONALIS:
OR, AN
EXERCITATION
OF THE
OPERATIONS
OF
MEDICINES
IN
Humane Bodies.

SHEWING
The Signs, Causes, and Cures of most Distempers inci-
dent thereunto.

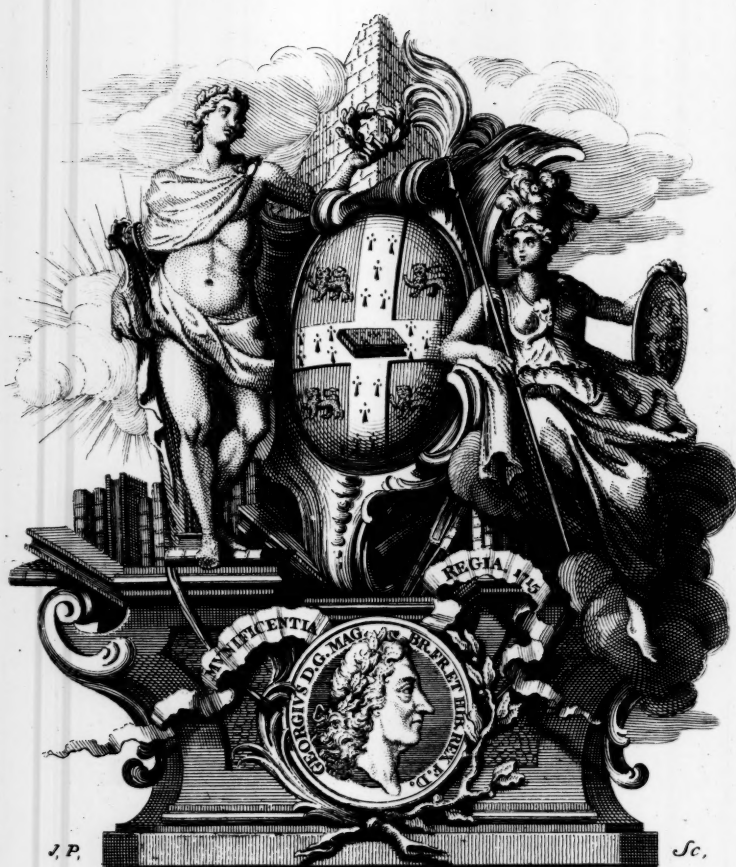
In Two PARTS.

AS ALSO
A Treatise of the SCURVY, and the several sorts
thereof, with their Symptoms, Causes, and Cure.

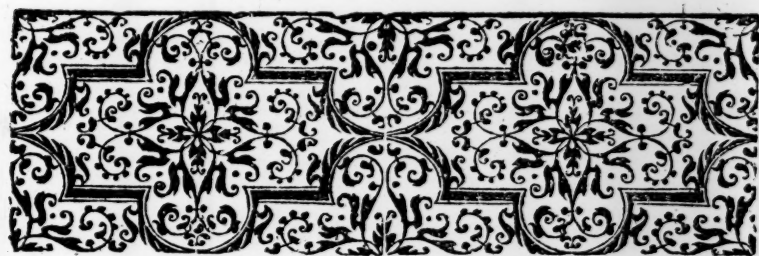
By *Tho. Willis* M. D. and *Sidley* Professor in the University of *Oxford*: Also
one of the College of Physicians in *London*, and Fellow of the Royal Society.

Licensed, October 31. 1678. R. L'Estrange.

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THE
P R E F A C E
TO THE
R E A D E R.

WE have observed that it hath been of exceeding great Benefit to many other Arts and Sciences, that Experiments and Observations either by chance or on set purpose being found out, that presently the *Ætiology* or the reasons thereof, as much as may be, should be set down, which thing we have much desired in Physick, which may be justly placed amongst the noblest of the Sciences. In Mathematicks and Mechanicks experience and practice did first assist the Theory, then this shewing the causes of things and the means of their effecting, hath not only adorned, but very much increased and illustrated the practice. But the Medicinal Art, although at first known to Empiricks, and taken up by quacking Juglers and old women, as if it were a Mystery into whose Reasons it were not lawful to search, has remained hitherto unexplicated: Wherefore the unlearned, and

The Preface

indeed sometimes the learned at this time give Medicines (like People shooting at random) rashly and almost fortuitously; being uncertain whither they will tend, or what end or effects they shall have. From hence it is, that not only some learned Cynicks, but the vilest of the scum of the people bark against and sling dirt upon Physick. And truly I know not how she will be wholly excused from being called a Liar, Vain and Jugler, so long as yet the reasons of curing by medicine, on which the life and health of Man much depends, and oftentimes by which 'tis no less endangered, lye hid. But this Doctrine of Medicinal Operations either neglected or ignored, shewing like a great Chasm, hath been the only, or at least the greatest impediment that Physick is not come to its perfection, and its whole System rightly framed: For though the matter of Medicine gotten from each family of the Vegetables, Minerals, and Animals, seems sufficiently digested and compleated, and that the Types and Natures of all Diseases being collected by most accurate Observations, are explicated by innumerable Authors, and besides that the humane Body as it were a martial Field, where those Champions try their Skill, be exactly described as to all its parts by Anatomists, yet what is of greatest moment, and without which the aforesaid things signifie little, is not yet sufficiently and clearly detected, to wit, what the weapons of those Champions are, what Furniture, what Force and resistance they have, also what Action, Passion, and Reaction may be between the Particles of the Medicine and the Spirits, Humors, and solid parts. But since almost the whole business of this Pharmaceutick Drame is acted behind the Curtain, therefore the various congressions of Particles, Fermentations, Impulses, and
other

other diversities of motions, which performed within ly hid from the Senses, are to be searched out by a more deep Scrutiny of the Intellect, which if it may be at last performed, there is nothing more will be desired, whereby Physick being perfected in all its parts, may grow to a true Science and be practised with greater certainty not inferior to the Mathematicks. For so the Empirical remedies left us by the Antients would not be administered promiscuously and amiss (as is wont now by medicasters) in every state of the Disease or case of the Sick, but opportunely and always according to the most apt intentions of healing. Besides, new and more efficacious Medicines (as often as some great and unusual Diseases require them,) may be easily and safely found out, without any error of the Physician or danger of the Patient. For whilst it clearly appears what kind of Particles in the Patient are either to be altered or stirred up into motion, and what are required in the Agent for that work, it will be no difficult thing aptly to design this, and rightly to accommodate one to the other. But the business is far otherwise performed by those Pseudochymists with notable danger and abuse of the humane Body, who not contented with the use of received and approved remedies, brag that they have framed in their Furnaces no less than a great Elixir, a certain Panacea, or an universal Medicine, whilst in the mean time they unskilfully meddle with Minerals, expecting a certain uncertain event rather than designing any thing seriously; If perchance there should appear an unusual product with this new Medicine (the virtues of which are altogether unknown, or are none, or poysonous,) they promise themselves presently to cure all Diseases

The Preface

Diseases, and give it boldly in every case to the great hurt, and not seldom to the Destruction of the Sick; so securely and rashly are these Executioners wont to sport with mans Life, whilst they are led to the preparing or administering these Medicines (in which always lurks some venomous Sting) without any counsel or direction of Method, but by mere chance and with a certain blind undertaking.

Therefore it is highly to be wished, both for the Dignity and Augmentation of Medicine, and for the Cure and safety of mans Health, that the Energies and manner, as to the nature of each, and as it were the mechanical means of the working of Medicines in our Bodies might be laid open. For if it shall be plainly known by what means Medicines being taken do presently exercise their powers in the first Passages, and from thence by and by diffuse them thorow the whole Body, and what alteration they receive in each Region, and what they do or perform upon the Spirits or Blood, and Humors or solid Parts, then indeed Evacuation may be much more safely and certainly used, and with greater Benefit to the Sick.

But if having boldly assaulted this Province, to wit, the shewing a reason of the pharmaceutical Operation before untouched, I shall not sufficiently perform my work, I do however deserve Pardon because I am forced to travel thorow not only an unknown Cuntry, but also one that is uneven and as it were a Labyrinth; and if perhaps going thorow this tract I have not yet sufficiently found out all the more secret Recesses, and every more intimate Corner, and what is acted in them; yet I suppose that I have made way for others, who may have a mind
more

more accurately to find them out.

For truly if these two things which I have followed in the whole Disquisition should be exactly known, *viz.* By what means Medicines or their Particles affect the Animal Spirits in every place, also by what and how many ways they Ferment the Blood and Humours, from thence a Path would lead to the unfolding the Reasons of every Evacuation. For the better laying open of the ways of the whole curing by Medicines, we have taken care to have accurately discribed the Ventricle and Intestines, even to all the Membranes and Fibres of them, in which the Animal Spirits dwell, and where they are first of all affected by the Particles of the Medicine. For although the Substances, Figures, Cavities, Sites and Connexions of these are long since sufficiently enough delineated, yet we have manifested most clearly without any example or following of any other Authors; the Nervous and Musculary and Glandulous Membranes of each of them, and some Fibres meerly sensible, and others motional, as also the thick set enfoldings of the sanguiferous Vessels, and innumerable Glandulas incrusting the Back of the interior Coat from the Mouth even to the Anum, this making very much for the illustrating the pharmaceutical Doctrin: concerning which Anatomical Inventions I must acknowledg my self to be beholden (as formerly to some others so now again) to the Industry and sedulous Pains of the Learned Doctor *King*; and also my Friend Doctor *Masters* hath set to his helping Hand, in the finishing of this Task.

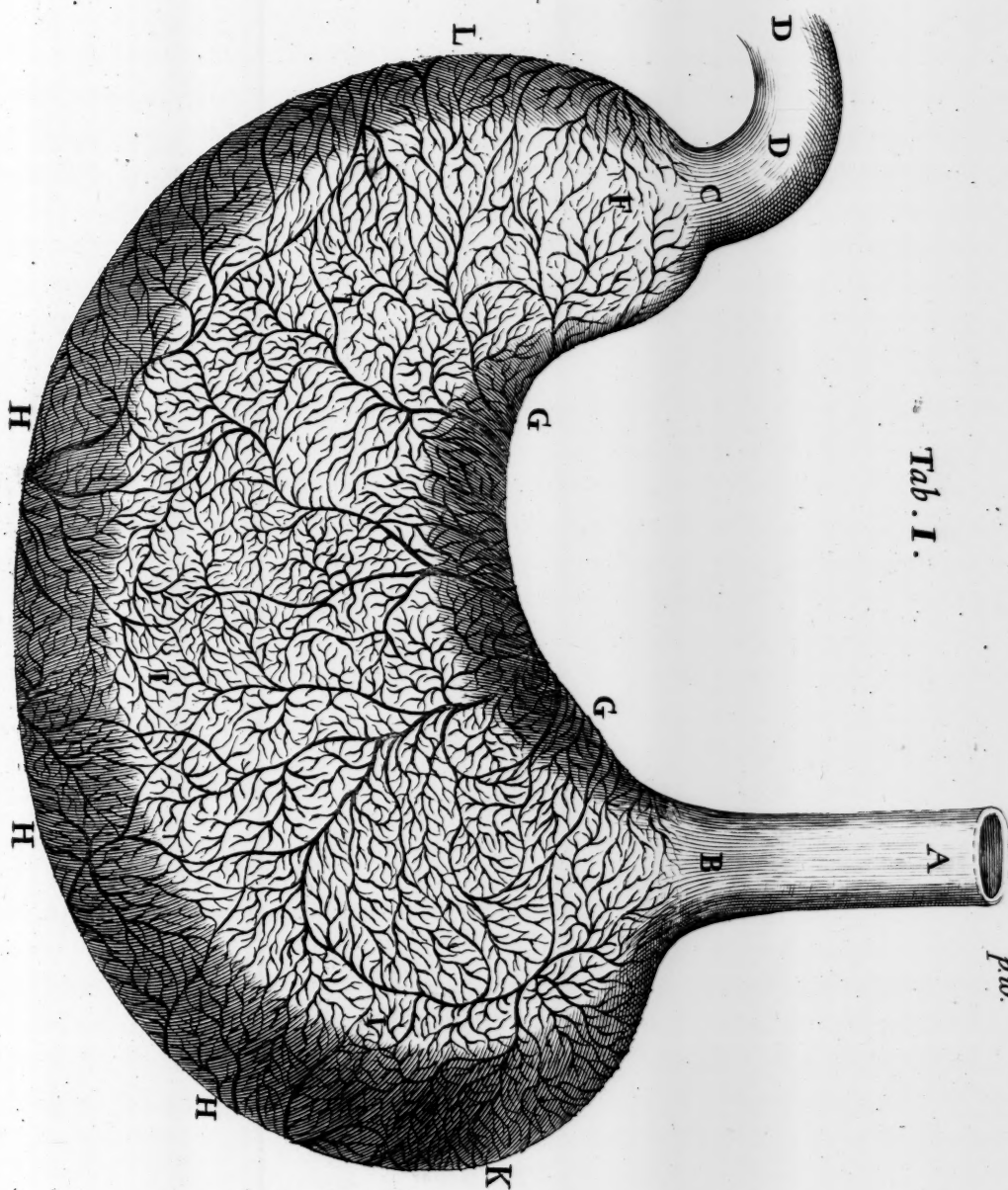
At the begining of this Work I did design to handle the whole Pharmacie and to weigh the reasons
of

REPAIR

to the Reader.

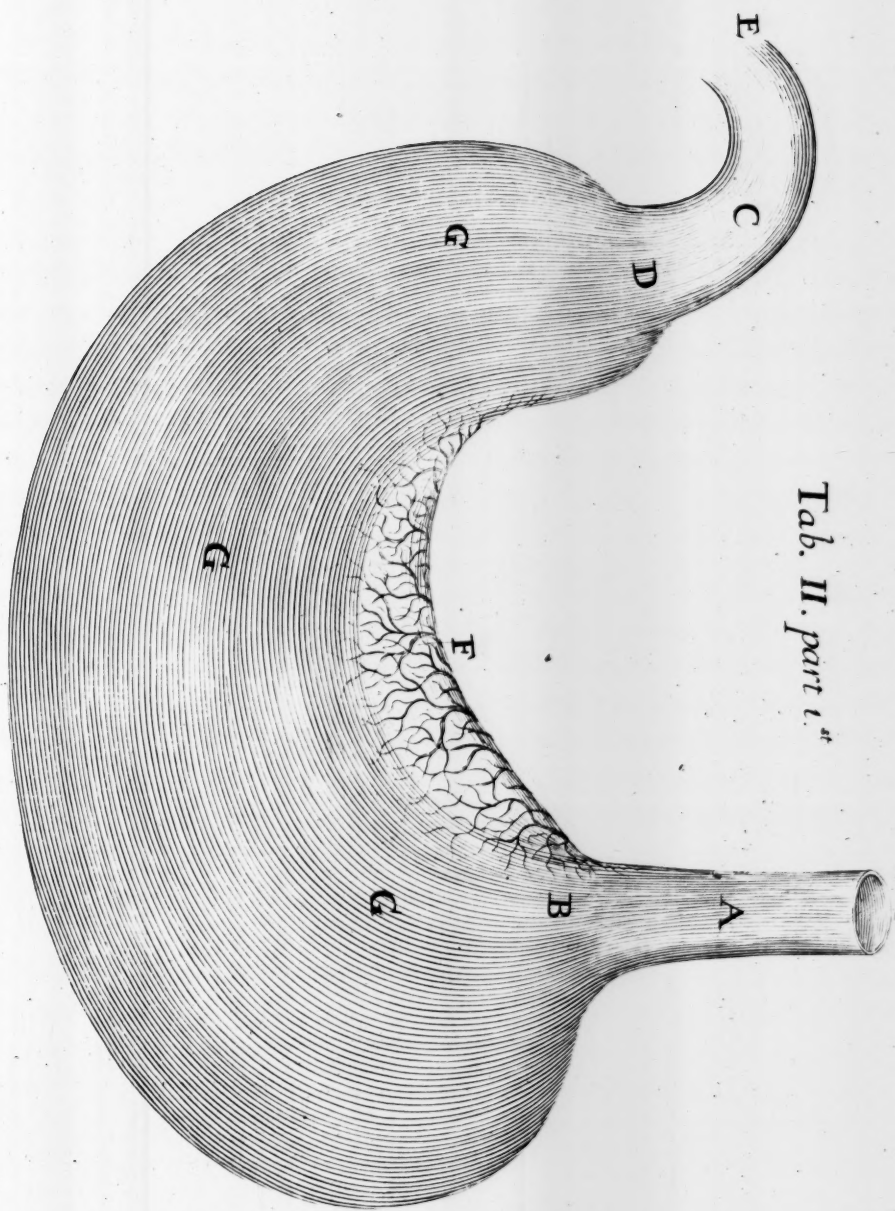
of all or at least its chief Operations: But whilst this work was under my Hands it grew into so great a Bulk through the Fertility of the subject, that I was forc'd to break off long before the end, and to finish it before I had half done. For besides the universal Medicines whose Energies and manner of working we have already described, there are other remedies (commonly called Specifick and Appropriate) which belong to this Speculation; to wit, which are given to cure either some peculiar Diseases, or which are said to respect some Region or part of the Body. Of some of these and especially of Medicines proper for the Breast I had begun some Meditations. But when I consider that I must Sail in a dangerous Sea, every where full of Rocks of Censures and Contumelies. I think it no Wisdom to venture my whole Cargo at once in this weak Bottom, but first of all with these few to try my Fortune, which if it be prosperous, I may perhaps be less affraid to expose the rest of this Nature hereafter.

The

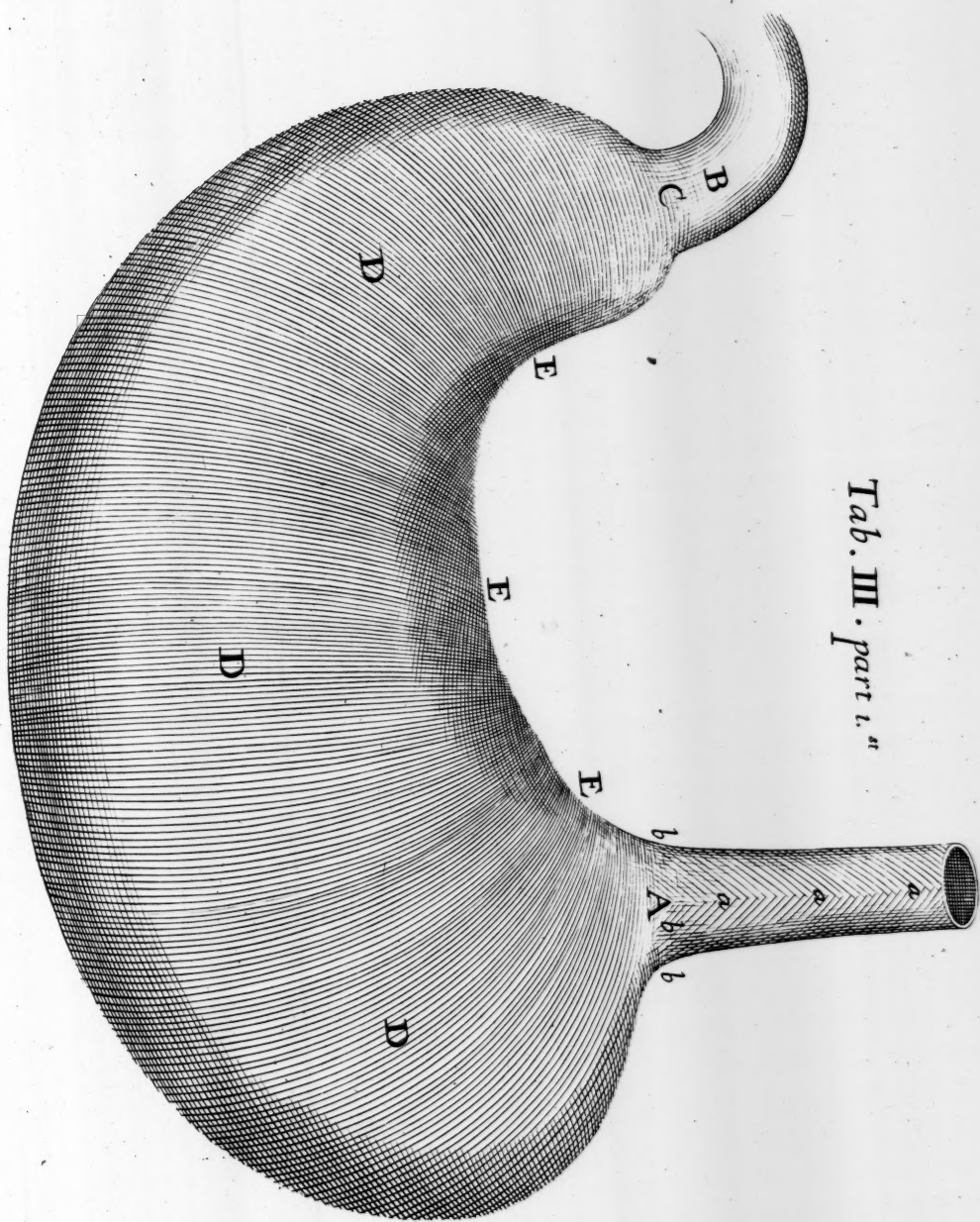


Tab. I.

Tab. II. part i.^{re}



Tab. III. part i.



Tab. V. part i^{re}

Fig. 2.

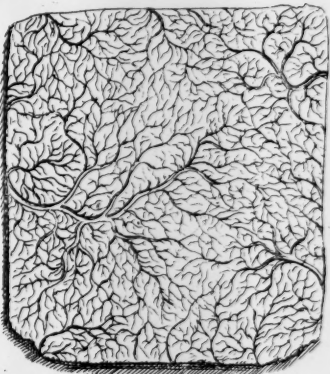


Fig. 3.

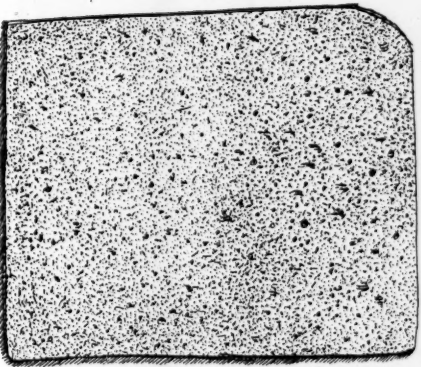
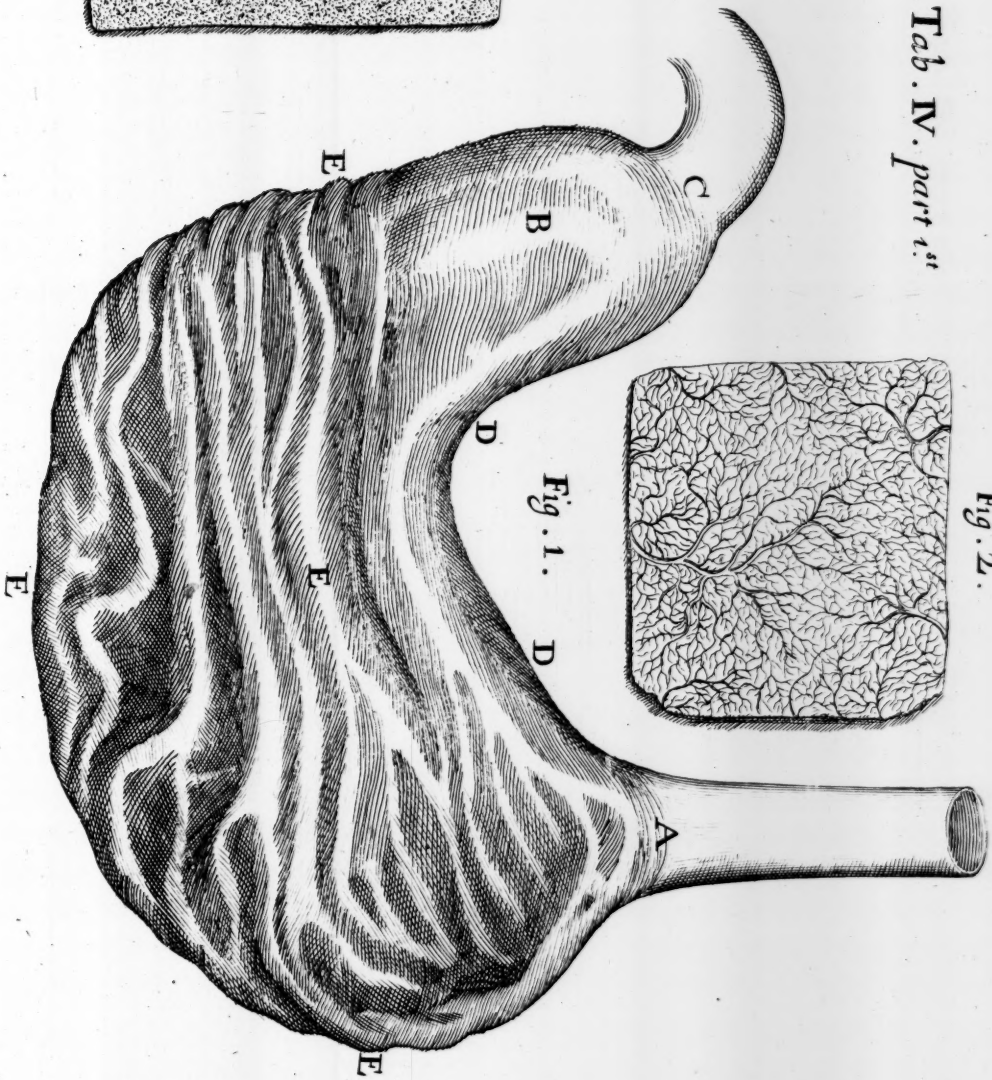
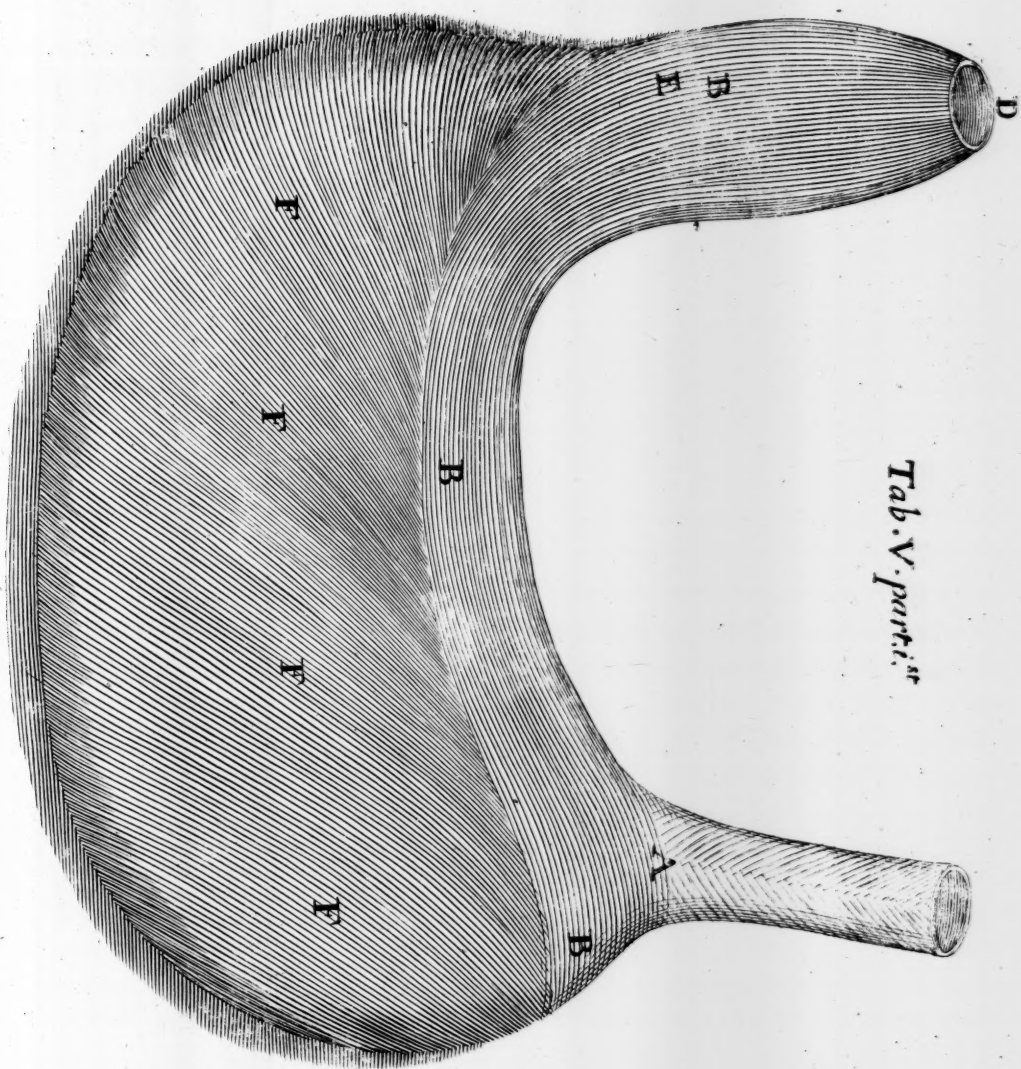


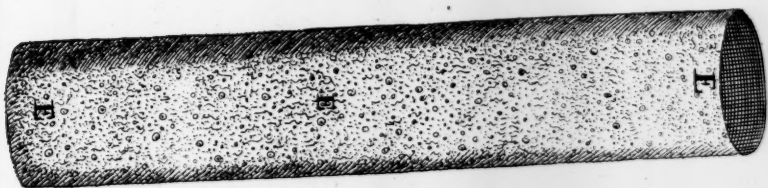
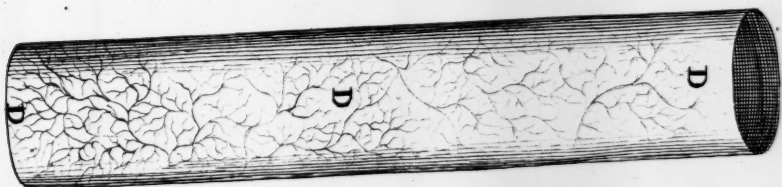
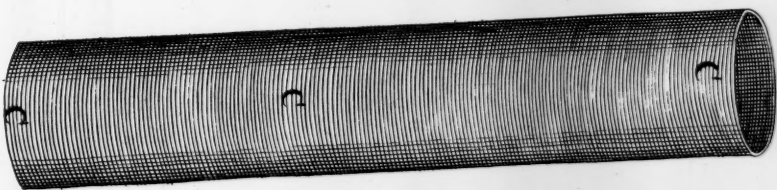
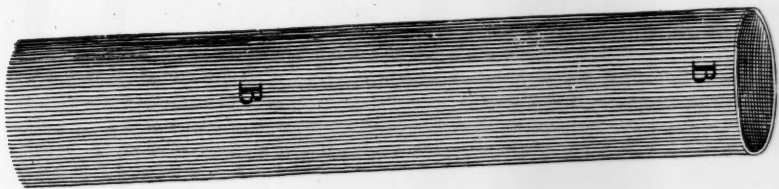
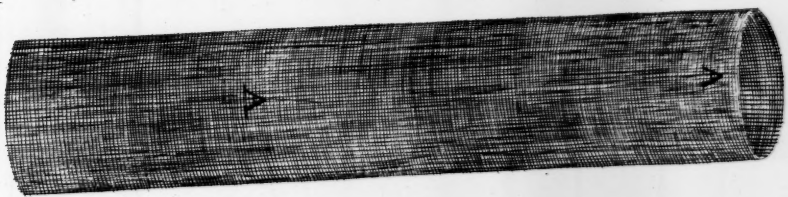
Fig. 1.





Tab. V. part. 1^{re}

Tab. VI part. 1^a



1874

THE
FIRST PART
OF
Pharmaceutice Rationalis,
OR OF THE
OPERATIONS
OF
MEDICINES
IN
Humane Bodies.

SECT. I.

CHAP. I.

The Design of the whole WORK.

THe Art of Medicine from the first Invention thereof to the time of *The beginning of the medicinal Art.* *Hippocrates* was merely Empirical, as may be found by those who consult the Annals. For that as several men made tryal of several remedies, if they found any by Experience to be helpful in any Disease, the same was made use of to others also in the like Case. Wherefore, as *Herodotus* tells us, the antient Egyptians did not carry their sick to the Physitian, but set them in the streets and high-ways that they might consult the Passengers for Cure of their Diseases. And so, both the Priests of these and of the Greeks, taking notice by what remedy every one was healed, committing it to writing, they laid up careful in their Temples their observations, that they might on occasion be communicated to other sick people. After this, the Heap of observations daily increasing, *its increase and progress.* *Interum* Physick began to be reduced into precepts and method

Part 1.

The shewing the reasons of medicinal Operations desired.

The Reason of these things enquired into mechanically.

The Places of the operations of Medicines in the first place noted.

The Subjects of them the Spirits and the Humours.

After what manner Medicines do work upon the Spirits.

The Spices of the Humours recited.

After what manner Medicines act upon them.

method, and upon this double hinge, almost all the whole business turn'd, to wit that the matter of Medicine with all its furniture, might be aptly dispensed, and in several forms of prescriptions, and also that the *Indicationes Therapeuticae*, or the setting forth of the method of Curing, with the use of the medicinal Householdstuff, might be rightly made known. If any one were very skilful in these two parts, he was thought to bear away the Bell in the Medicinal part of Physick. But truly in this matter, and in the practice of Physick we may deservedly place among the things that are to be desired, what hath as yet been unfolded by no body, by what order, and by what affection of the parts of the humane Body, Medicines being taken inwardly, or outwardly applyed, do perform their operations, to wit, how and why this vomits that purges, others sweat, or move to some alteration, or operation of some other kind; what affinity there is of the parts and particulars in the agent, and patient, or dissimilitude, pulsion, impulsion, and reaction: and then with what struggling and fermentation they are agitated, when mix'd together, and by what Workmanship or Energie they produce their effects. The vulgar Solution of these was wont to be, that Medicines did work by certain specificck Virtues, and did exercise their peculiar Powers, which thing truly is no more than to explicate the same thing by the same thing, as if they should say that some things are Vomits, because they are indued with the faculty of provoking us to vomit. Therefore for as much as this Therapeutic speculation has been almost left hitherto untouch'd by Physicians, it will seem worth the while to enquire into the reason as it were mechanically, which way Medicaments of every kind do exercise their force in our Bodies, to wit, that at our pleasures these do stir up the motion of avoyding the excrements in the Bowels or stop it, these excite the effervescencie of the Blood and Humours, or restrain them, and moreover by what peculiar respect they are able to yield comfort, as it were Tribute, to the wants of every part or member, or to irregular parts. Here, although it is not much to the purpose in what order the *Species* of Medicines are recited, yet for methods sake it seems good to me first of all to shew some general reasons of them, and in the next place to reduce them into *Classes*. Therefore as to the operations of medicines we ought chiefly to distinguish the places in which the virtues or their Energies do first and chiefly shew themselves, which commonly are wont to be divided into three Regions: *viz.* First, into the first passages, in which chiefly are comprehended the Ventricle, Intestines, the Pipe of the Gall, and Pancreas, and also the Mouths of the Meseraick Vessels. Secondly the Mass of Blood and all its Sanguineous Appendices, to wit, the *Præcordia*, the Liver, the Spleen &c. Thirdly, the Brain, and all the System of the Nerves, with the Members and the habit of the Body. Besides these distinct Spheres of Activity, of which sometimes these or those apart from the rest, sometimes more, or all together are reach'd by Medicine. In the second place likewise we ought to consider the immediate Subjects on which Medicaments do operate, and those are not doubtless the solid Parts, but are either the animal Spirits, or the Humours; nevertheless they also by the means of these are sometimes affected. Medicines inwardly taken, do act either immediately upon the animal Spirits, those which reside in the Fibres of the *Oesophagus*, of the Ventricle, of the Intestines, and in the first passages of other leading Pipes; or by means of the Blood upon those which do inhabit the Brain, and the nervous or membranous Fibres of more distant parts. When the Virtue of the Medicines touch them, whether these parts or those, they stir them up either by irritating them into an extruding motion, or by comforting them make them expand themselves more largely, and as it were rejoyce, or by asswaging qualifie their Disorders, and take away their Pains, or lastly by scattering them, they lull their Furie asleep. The Humours in which Medicines inwardly taken do impress their force, are both the Ferments, and Obliniments of the Ventricle and Intestines, The Blood with the nourishing *Succus*, and dross, *viz.* the *Serum* or Whey, either *Bilis*, the Pancreatick Juice the waterish Humour; and also the nervous Liquor: upon which sometimes singly, and sometimes together, Medicines do diversely operate, in as much as they sling them down and destroy them, or reduce them from that state: Sometimes they stir them up when sloathful, or if too much boyling, they allay and gently asswage them; or lastly they alter them being enormant in Quality, Consistencie, Temperament and other Accidents, and sensibly restore them to their genuine Constitution.

Constitution. When therefore there are so many and so various Considerations about the Operations of Medicines, the thread of our method leads to the places in which their forces do first and most chiefly appear; and in that respect we will begin with Catharticks, both Vomitory and Purgings: Then we will handle next Diuretick Medicaments, Diaphoretick, and Cordials: and lastly we will speak of Opiats and Specificks, as they are vulgarly called, that is, of Medicines respecting, either the defects, or inequalities of the inward parts of each particular Member. In the handling of each of these, we shall observe these three things *viz.* First, We will shew in every kind of Evacuation the means whereby Medicines do operate and affect, either the Spirits, or the Humours of humane Bodies, or both of them, and with them also the solid parts. Secondly, We will take notice of all the Kinds of every Class of Medicines, or at least the chief of them, together with the more select forms of Prescriptions. Thirdly we will describe the Chymical Remedies of the first rank which belong to each, and the Reasons of them, that is, the Variations of Changes and Accidents which happen in their preparations, as also we will add the reasons of their Virtues and Effects, which appear in them when they are prepared. In the fourth place there may be super-added to these another Exercitation in the medicinal part of Physick, to wit, that other more elegant, and more profitable provisions of these kind of Medicines, the reasons of Chymical preparations being rightly weighed, may be found out. But we will reserve this Institution for some other time because it contains Secrets easily violated by those rash Quack-salvers, who not without danger to the sick make experiments dayly of every medicinal Precept they find written, without any Controul. But that which is next to be done is that we describe, briefly and accurately the first Passages, vulgarly so called, in humane Bodies: *viz.* In which Medicines do first of all begin to operate, and are as it were the stage of every medicinal Action.

Part I.

The designed method of this Tract.

Three things to be considered in every Evacuation.

CHAP. II.

The Description, Use, and Affections of the Parts among which Medicines begin to work.

Since that Medicines are carried by the same ways into the humane Body as Food, and are born every where throw the same Pipes, it will be therefore of use, for the right understanding the means how it is done, as well for the reasons of the Chyle as of the Evacuation, that we delineate a certain Scene of the Parts and Inwards, in which either of these do act their Comedie. But to do this fully and amply in all its proportions, were to exhibit the Anatomie of the whole humane Body. Wherefore we will only delineate briefly those parts, into which Medicines are received, and where they begin to operate. These are then the *Oesophagus* or mouth of the Stomach, the Ventricle, and the Intestines with their appendices, in which not only Vomits and Purges, but also Cordials, Opiates, Diaphoreticks, yea and all other kind of Medicines, do first of all manifest their Virtues, and are determined to shew their Energies. We will not therefore give you a perfect description of these (which hath already been done accurately by other Anatomists,) but only brief Commentaries, which may serve to illustrate the business of Evacuation. Since then all Medicines more immediatly act upon the Spirits, or the humours, or on both together, and that the Subjects of them are the Fibres, Membranes, Vessels, and leading Pipes, we will particularly declare how these abide in the aforesaid Inwards, and how they are wont to affect.

The *Oesophagus*, according to the opinion of all Men, and common Observation, consists of three Coats. The interior of these hath as it were a certain Covering on its innermost Superficies, consisting in Fibres, as it were very small Hairs which covers its hollownes all over as it were with a certain Down; the rest of the substance of this Coat, is altogether nervous, endued with Fibres of various kinds, and diversely interwoven, like to the interior Coat of the Ventricle and Inte-

The first passages. *viz.* The Mouth of the Stomach, Ventricle, and Intestines, are the Stage of every medicinal operation.

The Spirits, and the Humours, the immediat subjects of Medicines.

The mediat are the Fibres, membranes, vessels and leading Pipes.

The *Oesophagus* consists of three Coats.

The more inward Coat full of Nerves, and covered with a hairy Crust.

Part I.

Covers for some
space and enters
into the Mouth
of the Ventricle.

And makes the
sense of the lust
in the whole
throat and
Mouth of the
Ventricle.

The second Coat
of the Oesophagus
or middle-
most being fleshy
serves for motion.

Two opposite
orders of the
moving Fibres.

The third or
outmost Tunick
of the Oesophagus.

The use of these
Coats.

What the Office
of the Hairy
Crust is.

The nervous
Coat is chiefly
made for the
sense.

Inquired if not
also for motion.

stines. Moreover this Membrane is continued to that which covers the Palate, Mouth, Jawes, and Lips: and also descending down even to the Ventricle, compasseth about its Mouth, and covers it round below on the inside of the Mouth, for the space of three Fingers breadth. This extreme part, within the Orifice of the Stomach, of this Nervous Coat, which is somewhat thick, and hairy, appears very distinctly from the more inward Coat of the Ventricle which it covers; which by a small Elixation may be more fully discerned; for then that Coat coming down from the Throat, appears wonderfully white, and otherwise, and more inward than that of the Stomach. This part without doubt serves chiefly to make the sense exquisite. Hence therefore grateful things being eaten, and swallowed down, a grateful affection of pleasure accompanies them even to the entrance of the Ventricle: so also from ingrateful things eaten, or thought upon by an irritation here made, there oftentimes follows Nauseousness and Vomiting. Moreover the deep letting in of this Coat into the Ventricle makes that intimate and quick intercourse between the Stomach and the Throat; so that if either part be provoked to Vomiting, presently the other is led by consent: and since the same Coat cloaths also other parts of the Mouth and Palate, these in like manner by a natural consent are affected in Vomiting.

2. The next Coat of the Throat is somewhat fleshy and thick, as if it were a pierced Muscle. *Hofmannus* indeed asserts it to be a Muscle and to be obnoxious to the Palsie and to Convulsions. The fleshy Fibres of this Coat were commonly thought round and transverse: but *Clay. Stenon* hath observed them to be spiral and of a double order, which mutually strike between one another, and are formed like two Cockles put opposite one to another. Upon these, as much as I have been able to collect by my own observation, the whole *Oesophagus* seems to be composed of two Muscles knit together, which make four parallel Lines with the Opposite Fibres, and cutting one another across. This plainly may be perceived, if this middle Coat of the Throat be taken off from the rest, and the extreme parts being tyed, it be distended by inflation, and sometimes immerg'd in seething Water, that the Fibres may be contracted and swell, for so there will be discerned two series of descending Fibres with their Tendons. Then if this Coat be turn'd on the other side, and be likewise blown up, the opposite orders of the ascending Fibres will appear to your sight. Lastly, if the Coat be cut in two in the middle by the long Tendon, and folded out plain, there will appear two parallel Lines on one superficies, and as many opposite upon the other.

3. The third and outmost Coat of the *Oesophagus* which is common to that and to the Ventricle, arising from the *Diaphragma* or Midriff (to which it is united as it passes throw the Hole of it,) is most small and is indued with membranous Fibres only, and they very small.

As to the use and office of these parts, we say in General that the inmost Coat serves chiefly for the sense, the middlemost for the office of Motion, and the third that it might be as a covering for the whole: But because these are the first passages, or porch to Evacuation, it will be worth our pains that we inquire a little more largely and particularly into them.

First then this interior Coat of the *Oesophagus* which is covered over with an hairy Crust as it were a certain Down (which also is common to the Palate and Tongue) seems to be so made for the better invitation to Eating, which is a thing so necessary to maintain Life, to wit, that whilst grateful food is swallow'd down, it might be able in the whole passage of the *Oesophagus*, to be lay'd hold on by those little hairs, and to stick for some time to them, that it might impress a sense of its pleasure. But that the Coat it self consists of so many variously interwoven nervous Fibres is, that it is chiefly made for Sensation, next for strength and firmness, as a little basket woven with very many twiggs, and thirdly that that part might be the better extended. But the chief Office of them is to receive the approach of sensible things, and presently do deliver them to the common sense, so that according to the affections either to things pleasing or displeasing there stirred up, the motions of swallowing or rejecting might be continued, or excited a new.

Here also it may be justly inquired into, whether this so very nervous Coat, so very much interwoven with numerous and various Fibres, may not also serve for some motion? For that it happens that the *Oesophagus* and its parts are diversly moved,

moved in Swallowing, Spitting, Vomiting, Yauning, and other affections, and when the other inward membranous parts, and chiefly the Ventricle and Intestines, are on every side moved: It ought to be unfolded how these various Actions, or passions are executed, and by what Fibres, and after what manner they are affected.

Fallopins the chiefest Anatomist of his time, when he had observed in the Muscle (which is the chief or the only Instrument of Local Motion) two parts, one of them which contained the fleshy body of the Muscle, to consist of fleshy Fibres, and the other, which was the Chord or String, of nervous Fibres: and by these two the Body only of the Muscle to move and contract it self, but the Chord only to be drawn, not to move it self; at length he concludes that no particle in the Animal can move it self, unless it be Fibrous and hath true flesh. *Observ.*

Anatom. p. 412.

Agreeable to this we have shown lately in a peculiar Tract, that, and how, every motion of Contraction is performed only by fleshy Fibres, viz. These by the sudden rushing in of the Spirits (which leap from the tendinous Fibres) being inflated and blown up, are presently made shorter, so that they thereby snatch up the parts hanging next them. But truly since it very plainly appears, some nervous parts, and especially the hollow *Viscera* or inward parts, not only to be contracted, but expanded, much blown upon, and enlarged into a greater capacity, which cannot certainly be made by the motion of Contraction; and since further it plainly appears that the animal Spirits move no less among the nervous Fibres, than in the fleshy, and not only to fill them gently, but sometimes to leap forth, very much irritated, or thrust forth more impetuously. These I say being premised, we will not doubt to conclude that the animal Spirits filling the nervous, or membranous Fibres, do not only effect sensation, which is their proper function, but also certain local motions, to wit, expansion, or inflation. For whilst the animal Spirits in their extrusion being agitated, and notably rarified, do more impetuously enter into these Fibres (which as well as the fleshy, being disposed not in certain orders but every where about, may be very much attenuated, and in the greater expansions distended, and dilated) there is a necessity that the inward parts framed of these should be every where blown up, and their sides on all parts unfolded, and being to the utmost attenuated, should be enlarged into a greater Capacity. Truly by the institution of Nature, as often as it happens to come to pass after this manner, it is certainly, that whilst the parts which the membranes do order, stretch under or cover, by this means are expanded, the superfluous Humours, or those that being infixed molest them, or such as stick to them, might be shook off and removed. For this end, and by this means, we think Stretchings, Yaunings and other certain motions of inflation and distention to be excited. Wherefore as in Yauning, we find the Pipe of the *Oesophagus* whether we will or no to be enlarged, and as it were blown up, and stretch'd out by a certain wind, we may conclude this affection to arise from thence, for as much as the inward Coat of the Throat, that it might shake off its too much humidity (wherewith it is grieved) it is stretch'd out, and enlarged with a certain thrusting forth of the Spirits. Moreover whilst we strive to hinder this motion of Yauning (because it seems always troublesome, and unhandson) presently the fleshy Fibres of the outward Coat, are moved to contraction: whereby there arises a certain struggling in the Coats of the *Oesophagus* (which we may easily perceive) made by these opposite endeavours of expansion and contraction. By what means the animal Spirits do blow upon the membranous *Viscera* in convulsive Affections, and lift them up, and intumesce, counterfeiting the springing up of live Animals, is shown by us in some other place. Further, when by some incongruous Medicine, or Poyson, Distentions and horrid inflations of the Ventricle or Intestines, and that not seldom, sudden and excessive rising up of the whole *Abdomen* happen; they are thus made, in as much as the animal Spirits being highly irritated, and brought to use their explosive force, they run altogether into the membranous Fibres, and extend them to their utmost; that the inward or *Viscus* which is knit to them is presently wholly blown up, and as much as it possibly may be is enlarged. But we will return from this little diversion of the membranous Motion, to consider the use of the other Coat of the *Oesophagus*.

The exterior Coat of the Throat, somewhat fleshy, and thick, for that indeed

Part I.

The opinion of Fallopius, of the motion of the Membranes.

Contraction only performed by fleshy Fibres.

Expansion caused by the nervous Fibres.

As in Stretching, Yauning, and Inflations of the inward parts.

How Yauning is made.

The Extension of the membranes caused by the thrusting forth of the Spirits.

Part I.

The middlemost fleshy Coat of the Oesophagus consists of two orders of motional Fibres.

Its outermost Coat.

The Description of the Ventricle.

It hath three Coats.

The Innermost is nervous and covered with an hairy Crust.

The use of the hairy Crust.

This glandulous Coat seems to be distinct from the other Coats.

it consists of two orders of fleshy Fibres, which ascend and descend obliquely, and shoot mutually one through the other, may be thought to be as it were a double Muscle, and as one order of the double Fibres descending, serves for swallowing, the other without doubt ascending, performs the business of Spitting, and Vomiting. I have known some by reason of a vehement Palsie in this fleshy Coat of the Oesophagus, to have swallow'd with very great difficulty, and others by reason that these Fibres were wholly loosned, to dye with Famine. Besides, it may be suspected that the sense of being strangled, and that round thing which ascends in those, labouring with the Hysterical passion to be from the Nervous Fibres of the inward Coat, whilst the Spirits in them are driven forth, being too much inflated and distended, 3. There is not much to be spoken of the outmost Coat of the Oesophagus, which is common; for this consisting of most small, and membranous Fibres, seems almost to be only for a Cover to its inward parts.

The Ventricle (in which the Oesophagus ends, thrusting its nervous Coat into its left Orifice) is somewhat long, like a Sleeve with a more ample bottom, spreading it self Orbicularly, with a plain, and short top, in which are two Orifices, placed one against another, at some distance: By that on the left side, the food that is taken in, descends by a right and perpendicular Pipe into the Cavity of the Stomach, where it is dissolved, and changed into Chyle; By the right hand door, whose passage is oblique, ascending again, it passes thence into the Guts; so that whatsoever goes out of the Stomach at either door, must be by a steep ascension; and as the Ventricle purges it self of what is contained within it on the left side, by Vomiting, or on the right side by Seige, there is a necessity that its bottom, and sides should be contracted together, and to widen upwards and to incline either to this or to that Orifice.

So much for the Faces of the Exterior part of the Stomach: but we will more largely consider its inward parts (which belongs to Evacuation) its Coats, with the textures of its Fibres, its Orifices, Vessels, and leading Pipes, and also the Actions, and uses of them all. The Ventricle as well as the Oesophagus consists of three Coats, one common with the Diaphragma, and two proper, outward, and inward.

This innermost is wholly nervous, and (as we observ'd in the Throat) its inward superficies is every where covered with an hairy substance, or straight Threads inserted perpendicularly to the Coat it self (like to shaggy Silk.) This Crust on the inside covering the Ventricle, after a little seething appears very plainly, but yet distinct from that which covers the Throat (being more livid, and more white) and seems like that which covers the Tongue. And indeed the sharp and Crustie Superficies, both of the Tongue and of the Ventricle, ought to be so, that the particles of the chewed Food, and of what is swallowed down, might for some time be detained by it, and from thence by degrees delivered over to the nervous Coat, which else might by their immediate and naked touch be too much irritated, and afterwards might be in danger of growing hard. Besides, this hairy Crust of the Ventricle serves also for other uses; for the reliques of the Chyle, being therein lay'd up and kept for leaven, or a certain ferment, they are become requisite, both for the Appetite, and for Digestion. But further this downyness on all sides defends and covers the Mouths of the Vessels, which are very thickly inserted into the nervous Coat, and also receive the humours flowing off from the Arteries and Nerves; whilst that in the meantime the Veins suck the Chyle, and other overflowing Juices in this part. This hairy Crust on the backside, or convex superficies, by which it sticks to the nervous Coat, is sowed all over with innumerable ringy glandulae, which without doubt do cover the Mouths of the Vessels, sticking in the nervous Coat, and as it should seem, receive and strain through them the humour destined for them, or more immediatly lay'd up by them.

This covering or hairy Crust, may be easily separated from the Stomach after it hath been dipped into warm Water, and appears to be a Coat of it self, firm enough, and distinct from others, and for the reason aforesaid may not improperly be called the Glandulous Coat. This therefore being taken away, the nervous Coat appears consisting of Fibres of various kinds, and diversly interwoven, by whose rare Web *A. A.* innumerable sanguiferous Vessels with their close Branches do shew themselves; and terminate in its interior superficies, where they stick to the glandulous Coat. The portions of both these Membranes, to wit,

wit, the nervous and glandulous are represented by Figures in the fourth Table.

This nervous Coat constitutes the interior Cavity of the Ventricle, like to a Chymical Vessel or Matrace, in which the Food is dissolved, and digested into Chyle. Its Fibres chiefly serve for sensation, and perhaps somewhat also for motion. As to the first, these being empty, they stir up Hunger, and being wrinkled up either through Dryness, or Saltiness, or Heat, by Spiced Meats, or Wine, they cause Thirst: when sharp and acid Humours do prick or pull them, it causes the Gnawing of the Stomach. Lastly, all Medicines do first of all act upon these Fibres, and according to the sensible impression made upon them, the Operation after this or that manner happens, as shall anon be more specially declared. As soon as these Fibres are filled by fit Aliment put into the Ventricle, presently there arises a certain Satiety and Complacency in the Spirits inhabiting them, and from thence a certain refection and as it were rejoycing by the consent of their whole Convention, or of all the sensitive Soul. In the mean time as the Veins do suck the most subtil part of the Chyle, most rich Food is given to the vital Flame.

As to the motion of this Coat, although we should deny to it spontaneous Contractions, yet it very manifestly appears, that it is frequently distended, inflated, blown up, and enlarged into a greater Capacity: which comes to pass, not only by the Winds begot within the cavity of the Stomach, but more often by the Spirits inhabiting the Fibres themselves; which, if they be very much irritated and agitated into an explosive Impetuosity, they highly inflate, and distend them all at once, whilst they tumultuously and in heaps run into them, and so intumesc the whole membrane like to a blown up Bladder. For if these nervous Fibres are made hollow and like a Pipe, and that the Wind on a sudden is blown into them, there is a necessity that that Vessel about which they are woven, should be thereby distended and dilated. In like manner also it is when the Spirits, as it were struck with a Fury, do rush more impetuously into them. For this conjunct Cause, the Ventricle, being so affected, is wont to be blown up in Hysterical Paroxysms, and Colicks, and very often in the Hypochondriack passion. From hence also sighs arise, and their reciprocations, which happen, because that the Ventricle, by these Fibres, is sometimes inflated, and sometimes thrust back by the Systole of the Diaphragma. Lastly, deadly and venomous Medicines, in as much as they stimulate the Spirits, and furiously stir them up into these Fibres, they often induce horrid Inflation and Distensions of the other Inwards of the Ventricle, and almost from the like Reason we affirm the Tympany to arise.

This Interior Coat in healthful Bodies has many wrinkles, or folds, shewing themselves in the hollow Superficies of the Ventricle, which seem to be as it were so many Furrows or Inclosures, into which the small portions of the Chyle are scattered here and there, and detained by degrees for the sake of the better concoction, and that they might not flow together into a thick Mass. These Folds are made, for that this Coat is much larger then the exterior fleshy Coat, it is therefore necessary that it should have folds, or wrinkles, that it may be contained by the other. In Gluttons and great Drinkers, in whom by the too often, and too much filling of the Ventricle the fleshy Coat is very much extended, they have also the interior equally extended, all its wrinkles vanishing, it seems plain and smooth like a blown Bladder. The aforesaid wrinkles and folds are expressed in the first Figure of the fourth Table.

2. The next Coat of the Ventricle, which is specially and wholly fleshy, consists altogether of fleshy Fibres, and seems to serve only for motion, and that for the Contractive only. But truly the whole Body of the Ventricle is covered with a membrane or this fleshy Pannicle, which draws it together and composes it diversly, for many various uses and offices that it meets with. And for that the Stomach in the work of Chylification, and in the Operation of Medicines, ought to be altered and changed into various gestures, therefore this Coat contains manifold orders of motional Fibres, never enough to be admired. Although it be not easie to describe them being so very intricate, yet because it makes much for the reasons of Evacuation, I shall to my power endeavour to give you this particular Anatomie hitherto almost untouched.

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Part I.

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The Office of this Coat as to the sense.

The Affections as to motion.

How the Inflation and distensions of the Inwards are made by the nervous Fibres being affected.

The reason of the Tympany hinted.

How the folds and wrinkles of the Ventricle are made, and for what use.

The Fleshy Coat of the Ventricle.

Many orders of motional Fibres in the fleshy Coat.

How the Furniture of the Stomach may be seen.

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The Fleshy Coat of the Ventricle.

Many orders of motional Fibres in the fleshy Coat.

How the Furniture of the Stomach may be seen.

Part I.

Viz. to immerge it in hot Water.

Then the outward Coat being observed and separated is to be taken off.

Then the order of the Exterior Fibres of the fleshy Coat will appear.

How the order of the interior Fibres may be found out.

Their description.

The use of its Fibres.

in scalding Water, that the Fibres a little contracted may swell, until it seems half boyled; then the outward Coat or the membrane Covering the whole Ventricle may be noted. The Fibres of this, running from one Orifice to another, compass about the Bottom and the Sides of the Stomach, the whole length of them, and they appear to be shorter or longer according to the various compass of their stretchings out, and also more streight or more oblique. Moreover in some places viz. near the Orifices and about the bottom and ends of the Stomach, they are much thicker than in the middle, and there indeed they may be seen after a manner fleshy and moving. The nervous Fibres of this Membrane (as may in like manner be observed in most of the Muscles) cut the fleshy Fibres lying close under them in right angles; so that they not only cover them, but bind them fast, that they may be contained each of them in their orders, and that they may not leap out. The second Table very aptly represents this Figure.

This Coat therefore being separated, and removed, underneath lyeth the series of fleshy Fibres in right Angles, which compassing about on the superior Plane, the Bottom, and Sides of the Ventricle, even to the depth of it, which is the *Interstitium* of the Orifices, they terminate in the Orifices themselves. Without doubt the Office of these is, while they are contracted, to draw upwards the bottom and sides of the Ventricle, and thereby to straiten its cavity, so that what is contained therein, being spread abroad either towards this or that Orifice, might be evacuated. The exterior or convex Superficies of this fleshy Coat with the order of motricious Fibres, is exactly delineated in the third Table.

But that its extruding motion might be determinately made, either towards this or that Orifice, and the matter included in the Stomach might be conveyed forth either by Vomit, or by Seige, is the work of the other Series of Fibres, which being transverse in respect of the other, bring together one Extremity of the Stomach, sc. the left or right, against the other; So that whilst the Fibres of both kinds do coact, the Stomach being contracted in all its dimensions, and broad upwards, doth cast out what is contained therein by that Orifice to which on occasion it is inclined. And that there are such Fibres, and that they ly under the former, may be very plainly made manifest to these who shall see the other interior or concave superficies of this Coat. Therefore the Ventricle may be so inverted, the Orifice of the *Pylorus* being a little cut, and its joyning turned back; that the interior and concave superficies, and the exterior and convex may come together, and then the hairy Crufts of the interior Membrane with its wrinkles and folds, as is above described, and elegantly expressed in the first Figure of the fourth Table, will appear. Then after a light immersion in warm Water, the hairy Crust being separated, and taken away, we may see the nervous Coat it self, covered over with a most thick Ramification of Vessels: we have taken care that the portions of either of these and the superficies of them, with the Glandula's, and to which of the Vessels they stick, may be discerned in describing exactly the second and third Figure of the same Table. Then lastly the nervous Coat being wholly taken away, the interior fibrous Superficies of the fleshy or middle Coat, as it is delineated to the Life in the fifth Table, appears in view. So that in this Ramification of fleshy Fibres there is a notable order, which are seen to arise behind the Mouth of the Ventricle, and to compass about its left extremity, and then they are carried forward towards the right region of the Stomach. A notable company of these running along on either side in streight Lines to the top or summit of the Ventricle, enter into the hole of the *Pylorus*, hiding here and there the length of its Cavities, terminates in the Orifice it self, as it is represented in the fifth Figure. But the other Fibres of this Order range on both sides of the Stomach obliquely, and so likewise towards its bottom, where they meet. The Office of the former seems to be applied to what is to be done by either of the Orifices, by one for the avoyding the excrements, which is done by the lower, and also respectively by the upper; for the same Fibres draw to the right or left, according to the convulsion beginning at this or that end of them; as we have shewn in our Tract of the motion of the Muscles, lately published. If at any time a contraction begins towards the *Pylorus*, whilst there the bottom of the Ventricle and the sides are drawn together by other Fibres, both interior, and exterior, its mouth also is by those right ones inclined towards the *Pylorus*, therefore what ever is contained in the Stomach is transmitted to the Intestines. But if the contraction be begun by other Fibres at the end of these, towards the mouth of the Ventricle, whilst there, its

Bottom

bottom and sides are drawn together by other Fibres, the *Pylorus* also is drawn together towards it, for the action of Vomiting. As to what respects the other oblique Fibres of this order, whilst by a Convulsion beginning from the right end of them, they are drawn downward and obliquely, by their motion they incline the left chamber of the Ventricle towards the bottom and *Pylorus*, cooking for nourishment, what is there more strictly compressed and rolled together: On the other side also, by the Convulsion begun from the left, they being contracted upwards and obliquely, cause the bottom and right chamber of the Ventricle to be snatch'd up towards its mouth, to excite Vomiting. According to either of these contractions, the exterior fleshy Fibres, constituting the convex superficies of the middle Coat conspire in the action, so that they strain more the cavity of the Ventricle, and more aptly compose the endeavours for evacuation upward or downward. Wherefore according to which, an irritation being here or there made, a contraction begins either towards the *Pylorus* or the mouth of the Ventricle, and the whole capacity of the Ventricle being collected, and brought upwards, it is inclined hither or thither, and endeavours to cast forth either above or below. We have taken care that either superficies of this Coat, and the distinct series of the mottricious Fibres therein, be exactly described in the Figures of the third and fifth Table. I shall not in this place rehearse and explicate every species of contractive motions, which this fleshy Tunicle of the Ventricle hath; of which sort are such as are wont to be stirr'd up in those that are affected with the Cramp, we shall shew them in another place, and we will declare how they are moved by the operations of Medicines, when we shall treat of each in their kind. In the mean time we will take notice of those motions to which this fleshy Coat is wont to obey, the Instinct or Impulse diversly to be communicated, *viz.* First of all, and chiefly from the nervous Coat lying under, which, as from the contents of the Ventricle it is variously affected, by and by, for retention or expulsion sake provokes into contractions of this or that sort. But the Nerves inserted into this fleshy Coat, carry to it the various instincts of motions from the *ἐγκέφαλος* the neighbouring parts, or remote from above or from beneath. From hence the Ventricle is oftentimes disturbed, and after divers manners moved by the Phantasie, by the Appetite, yea and by divers affections either of the Soul, or of every part of the Body.

The outward Tunicle of the Ventricle is common to it and the *Oesophagus*, of the same texture and substance, as we intimated even as to the use of it, this being the covering of the whole Ventricle, it cloaths the fleshy Fibres of the underlying Coat, binds them with its Fibres, and holds them fast together as it were with Twiggs. The Fibres of this membrane (as we have already observ'd) are in certain places more thick, that when the Ventricle is fill'd beyond its measure it might be very much distended. These seem to serve but little for motion, but yet somewhat to sense; although there should be but a very small use of it, for that nothing from without can fall upon it, nor any thing taken in at the Mouth can touch it. But if that some serous Humour or impostume, or constant bilious Suffusion happen on the neighbouring or contiguous parts, for as much as this Coat is much, and often irritated, there is excited in the Stomach almost a continual nauseousness, want of Appetite, and frequent Vomiting, as I have observed in very many that have been dissected after they have been dead. The chief use of this Tunicle is, that being the whole covering of the Ventricle, it cloaths the fleshy Fibres of the underlying Membrane, sustains the Ramifications of the Vessels, and serves as well for the strengthening the Ventricle, as for to conserve its heat. Moreover it is not improbable, that there are in certain places of this Coat nervous Fibres, in the place of Tendons, respecting the fleshy Fibres lying under them.

The Ventricle being after this manner like a sleeve, made up of its three Tunicles, as it were a threefold Garment, hath two doors or orifices, placed on the top, over against one another. One of them on the left side stands for the Insertion of the Mouth of the *Oesophagus* into the Mouth of the Ventricle; and is after the same manner, as if the Pipe of a Tunnel were directed into the hole of a Bladder to be filled: The right and perpendicular Pipe admits whatever is put in and swallow'd down into the Stomach. The other Orifice on the right side is continued by a long and oblique Ascension into the *Duodenum*, and by degrees puts into it the Chyle elaborated in the Ventricle.

Part I.

The same fleshy Fibres effect opposite contractions.

What contractions the fleshy Tunicle follows: The instinct from whence.

The outward Coat of the Ventricle very nervous.

And perhaps tendinous.

The twofold Orifice of the Stomach.

Part 1.

The Nerves and
nervous foldings
belonging to the
Mouth of the
Ventricle.

The description
of the Pylorus.

The Office of the
Pylorus.

Vessels belong-
ing to the Ven-
tricle.

Nerves.

Innumerable
Sanguiferous
Vessels belong to
the Ventricle.

Near this Orifice the wonderful Enfoldings of the double Nerve, wandering to the Ventricle, being delated as it were at its utmost bound, are plac'd, making as it were a kind of Net wherewith its whole circuit is hidden: Besides both the hairie, and nervous Tunicle of the *Oesophagus* cloaths the cavity of this farther; hence it is that the Mouth of the Ventricle being exceeding sensible doth wonderfully communicate with the other noble parts, and chiefly with the Brain and the *Praecordia*, so that indeed it was not for nothing that *Helmont* did place here the seat of the Soul.

The other Orifice commonly called the *Pylorus* on the right side of the Stomach having a capacious hole, by degrees grows long and narrow, and ends in a small hole, and from thence being retorted it is continued into the *Duodenum*. Here the Tunicles are much more thick than in any other place of the Ventricle. The nervous innermost is very rough with wrinkles and furrows, and is lifted up into the very hole it self, in a longish lump like to the Pipe of a Gutter, for the end certainly, that the Chyle going forth by degrees may not be suck'd back again into the Stomach. The fleshy Tunicle, as every where besides, hath two series of Fibres; for some compassing about the Hole they bind it, and as occasion serves, shut it fast; and others being carried by its sides the whole length of them, gathering together the other parts of the Stomach upward, do lead towards this door. But on the other side, these Fibres by reason of the contraction being at the other ends of them, do often draw the *Pylorus* towards the left Orifice, as in Vomiting: and if so be the Convulsion be long continued, the *Duodenum* is drawn upward, and for that reason, Cholera and the Pancreatick Humours are drawn forth into the Ventricle.

The Office of the Pylorus is, not only largely to transmit what is contained in the Ventricle, and together in great heaps, to the Intestines (which indeed it frequently doth in purges and *Diarrheas*) but rather the Chyle being well digested, to receive it into its bosom, and to keep it there for some time, and then by little and little and by very small portions thrust it forth. For truly its den being long, and capacious, it seems to be a certain resting or baiting place in the Ventricle into which a portion of the Chylous Mass, being more thorowly digested and perfected, may retire, and abide in quiet, until another part more crude, and latelier put in, may be more concocted in the bottom of the Ventricle. Hence it is, that when things have been eaten, oftentimes that which is ingrateful is vomited up, the other more grateful meats in the mean time remaining in the Stomach; viz. for that there are very many as it were distinct Cells in the Ventricle, in which those things put in are divided one from another, and may so remain. Moreover it is to be observed that vomiting Medicines when they work gently, do only stir the parts next the left Orifice of the Ventricle, but if they do more strongly irritate them, they draw from within, and upwards the *Pylorus* it self with the *Duodenum* hanging to it, so as to make an Evacuation of the forc'd *Bilis* into the Ventricle.

The Vessels belonging to the Ventricle are Nerves, Arteries, and Veins; the description of the former is exactly enough delivered in our Neurologie: viz. That the wandering parile Nerves ending on either side of the Stomach give to it notable branches, foldings, and manifold sprouts; moreover the nervous foldings of the Intercoastal Pares, being placed here and there in the *Hypochondria* and in the *Abdomen*, send very many and eminent branches to the Ventricle: which is the reason, that vomiting so often succeeds in Hysterick and Hypochondraick Passions and in Colicks.

There belong very many blood-carrying Vessels to the Ventricle, which may be plainly seen, if the Stomach of a Man, a Dog, or a Hog, the *Cæliack* Vessels being first bound, and cut off, be taken out, and the Orifices being drawn together, it be blown into, it will then be a very pleasant sight to see the lesser Trunks of the Veins and Arteries, part of them inserted in the top of the Ventricle; and part of them in its bottom, which by and by run one throw another into lesser Branches, and then dividing themselves again into very little and more small branches and shoots, mutually to clip, and on every side stretched out to creep about the whole compass of the Stomach, and with its branchie shoots to hide it. These Sanguineous Vessels tending inwardly, and at length scattered in innumerable sprouts are terminated

nated in the inmost nervous Tunicle; whose interior superficies through the thickness of the Puncts in which the Vessels end, is dyed red and as it were made bloody. This manifestly appears if that after the Stomach is immersed in warm Water, the hairy Tunicle be separated; for then the nervous Tunicle by reason of the close endings of the Vessels seems hidden as it were with a little bloody Net.

If you inquire into the use of them, they are ordained to be the cheif Instrument, for to convey the heat which is for concoction and digestion in the Ventricle, and hence they convey a sufficiently plentiful matter and Fire, viz. in as much as the Blood growing hot, round about the bottom and all the sides of the Ventricle, like a Cauldron, it is detained as a perpetual lighted fire; and indeed somewhat to this end, that bloody Lake seems to be there situated. But yet besides this, these Sanguiferous Vessels as we think, have another, not less necessary Office, viz. The Arteries to lay up some humour in the Ventricle, and the Veins to carry away thence perpetually some other, so that there may be made by their means an immediate and constant commerce backward and forward between the Chyle and the Blood.

But truly as Aliments being put in are dissolved not only by concoction, but much more by Fermentation in the Ventricle, and disposed into an homogeneous Chyle, they by a certain spiritual Liquor there, which as it were ferment (even as the Barn of Ale ferments other Ale) are imbued: This kind of Humour (and indeed plenty of it is required) the Arteries only can furnish, and this being conjoyned with the reliques of the chyle sticking in the hairy Crust, without doubt constitutes that juice which is commonly called the Ferment of the Stomach. Moreover when from things eaten oftentimes a quick Refection is required, and that truly it cannot be made by the long wanderings of the Intestines, and of the Chyliferous Vessels, what more like way is there than that the Veins sticking most closely within the cavity of the Ventricle, should receive a certain more subtle portion of the Chyle, and forthwith pour it into the Blood? After what manner the Sanguiferous Vessels inserted into the bottom and top of the Stomach do hide all its superficies with a thick and manifold Ramification, is to the life expressed in the first Figure.

3. We will go from the Ventricle to the Intestines, which being twofold, to wit, thin and thick, there will be no need here to write the History of them all, for that the number of them, and their conformation is already very well known, not only to Anatomists, but to every Butcher. In the former, as much as belongs to the medicinal part, there ought to be considered first their site and Fabrick, secondly their Tunicles, and thirdly their Vessels and leading Pipe. The Office of these is, to receive the Chyle elaborated and dressed in the Ventricle, to ferment it more, and from it more elaborated and perfected to press forth the nutritious Juice into the Chyliferous Vessels. Among these Intestines Cathartick Medicines do chiefly perform their operations.

Although there be but one continued Pipe of the small Guts, yet for the distinct Offices that they have, they are distinguished as it were into three *Stadia*, and as if there were so many Guts, have so many distinct names imposed on them. In the first of these the Chyle descending from the *Pylorus*, by and by is stained with new Ferments, viz. Choler and the Pancreatick juice, with which, since all its Masse by degrees, and all its parts ought to be imbued, therefore every portion passeth by a swift passage into this Region, viz. the *Duodenum*. In the next Circuit, to wit, the Jejunum or empty Gut, the Chyle fermenting is strained more freed from sourness, and acquires a greater volatileness; and as here also it ought not to stay long, by and by being fermented, it is carried forward, and leaves for the most part the pipe empty. Within the third Den, the Chyle being volatilised and perfected, is copiously heaped up, and stays there for some time, whilst the Intestine *Ileon* being so full of Chyle, strains it a little with its fleshy Fibres, the more pure and subtiler part is pressed forth to be transmitted to the blood, into the milkie Vessels (and also according to our opinion into the Mesaraick Veins) and at length the rest of the *Feces*, and almost worn out are moved forward to the thick Intestines.

All these Intestines, or the whole Pipe of them, have their Coats formed after the

Part I.

which end in the interior superficies of the nervous Coat.

The use of them.

The Arteries carry the fermental Humour.

The Veins receive the nutritious Juice.

The Intestine twofold, viz. small and big.

The site and dimensions of the small Guts.

There are three Coats of the Intestines.

Part I.

How they are
tyed to the Me-
fenterie.

same manner, which also do not much differ from the membranes of the Ventricle, unless that they are a little thinner. All the Intestines, both the small and the thick (except in the beginning and end of them, and a certain part of the *Colon* which is joyned to the *Omentum*) are as it were plainly knit to the brim of the Circular Mesenterie: Concerning which in the mean time it is wonderful, how that these Intestines which are about six Ells long, may be comprehended in that compass, that they are not above a Span distant from the Centre. Also we may observe, that the Plane of the Mesenterie is collected into many and great folds, and hath in its Circumference the length of three Ells; moreover that the Circumference of the Mesenterie, that it might press together the length of the Intestines, doth enfold in every single handful about twelve handfuls of the Intestines. As for many reasons it ought to be made after this manner, so chiefly, both that the Intestines might subsist in a little and narrow place distinctly, and without confusion; and also that they might be moved, by a slow and successive motion, and as it were creepingly, from one end to the other. For as much as the Tendons of the motricious Fibres, by which the Pipes or Cavities of the Intestines are drawn together, are placed on the Brim or Border of the Mesenterie, it is from this inward, that the instinct of every Intestinal motion proceeds, as shall anon be more clearly shown: In the mean time, we will a little handle the Coats of the small Guts.

The inmost Tu-
nicle has very
many transverse
wrinkles.

The inmost of these hath very many transverse Wrinkles, as it were eminent Ridges, which are movable, and are as so many remoras of the Chyle, and also serve to moderate its retention, viz. that it pass not too soon, and before it be perfected enough, and throwly pressed, flow with the *saces* themselves to the thick Intestine. These Wrinkles, as *Fallopins* hath very well observed, for that they are much longer in this inward Coat than the outward, therefore it is crispie and crumbled. For if this be taken off from the other, and that their foldings be stretched out, this will exceed the other three times in the length.

The nervous
Coat of them is
also covered
with an hairy
Crust.

Further, this interior altogether nervous Coat, containing in it the little mouths both of the milkie and bloody Vessels, is cover'd with the like crusty Nap as the inside of the Ventricle, and seems to be for the same use, viz. it covers and defends the mouths of the Vessels, and moreover sustains the first approaches of the Chyle, and of other contents, and then delivers them over by little and little to the nervous Coat. But this Coat consisting of every kind of Fibres, and constituting the inmost Chamber of the Intestinal Pipe, serves first of all for Sensation, and provokes according to the impressions made on it self, the fleshy Coat lying over it, to assist the excretorie motions more slow, or more swift upwards (but that rarely) or downwards. If at any time the internal superficies of this be stimulated by sharp things contained in it, or incongruous Humours do strike against its Fibres, presently by reason of the feeling Sense, troublesome griefs and torments are stirred up. Besides this nervous Coat is found to be very obnoxious both to distentions by included winds, and also to expansions, and intumescences by reason of the Spirits among its fibres. But this besides its nervous fibres, with which it is diversly interwoven, is every where covered also (as we have before mentioned to be in the Stomach) with a thick or close ramification of blood-carrying Vessels terminating therein: hence, as we may suspect, the Arteries perhaps do leave every where a certain recrementitious humour in the cavities of the Intestines, and the mesaraick Veins, no less than the milkie Vessels receive there a portion of the Chyle, and carry it immediately to the Blood.

Innumerable san-
guiferous Ves-
sels do terminate
in it.

2. The fleshy or
middle Coat.

In which is two
orders of motri-
cious fibres.

Viz. of streight
and circular.

2. The second or middle Coat of the small Guts is a little thicker, and altogether fleshy. Of this there are two orders of motricious Fibres lying under one another. The first and interior is ringie, which compassing every where with a close series the whole Pipe of all the Intestines, or all their whole Cavities, is implanted as it were by a Tendon, on the border of the Mesenterie. The other order is of streight Fibres, or longways, which lying over the others, and cutting them in right angles, stretch the whole length of the Intestines; and the outmost Coat seems to be in the place of Tendons to them, which being altogether nervous or as it were tendinous, is wrapped about with an universal series of these Fibres.

Their use is en-
quired into.

Astothir use, as it is the business of the Intestines to move forward the Chyle,

Chyle, and the *faeces* part by part, and so indeed by urging it to carry it at length throw all their Pipes; moreover whilst that they themselves are contracted, and abbreviated, so that their Cavities may be straitned to press forth the more subtil part of the Chyle into the milkie Vessels, and Mesaraick Veins, it is very obvious and easy to be conceived, how the aforesaid Fibres do perform this double task: for whilst the circular Fibres are successively or one series after another contracted, they make narrow the depth of the Intestines, and at the same time the long ones being inflated and intumefied, they make it more strait, and also make it shorter, so that there will be a necessity that the contents of these inwards, be compressed behind, and urged continually forward.

In the mean time it is not to be thought that the contractions of either kind of Fibres are so great and continual, that all the contents of the Intestines are driven forward altogether from one part to another (although that this doth sometimes happen in purges and looseness as we think) but ordinarily those lighter, and broken Convulsions, but yet made one series after another, and often repeated, do as it were shake the Intestines, so that they make the Chyle and the *faeces* gently to move forward from place to place. But by reason of these shakings of the Intestines, and their often repeated contractions, the Chyle being perpetually agitated, is the more elaborated and easily pressed forth into the Vessels gaping for its reception. But if it be ask'd by what instinct the forementioned Fibres of either kind be provoked into motion, and are determined, now these parts now those, one series after another to contraction, I say that the Intestines have it even as the Ventricle, *viz.* it depends upon the Sense of the nervous motion in either of the fleshy Coats, so that the contractions of that follow the irritations of this. As often as any thing that is disagreeing, or incongruous, impresseth any troublesome sensation upon the nervous Fibres, presently to shake it off, the moving Fibres draw together the affected part of the Intestine, that they might drive away whatever is troublesome.

First of all the reliques of the Chyle, which after the pure Juice is enough pressed forth, do ordinarily, and gently irritate the nervous Fibres, they becoming decay'd and troublesome; for until the distribution of the Chyle be thoroughly acted, the moving Fibres being contracted before, lest that it should slide away too soon, they are still, afterwards Convulsions being stirred up behind, they cast it forth as unprofitable. Secondly the nervous Fibres are a little more sharply agitated by Choler, and the pancreatick Juice from their Pipes, also by sharp Humours, and hurtful Suffusions from within the Arteries, whereby the same more often, and more strong contractions succeed. Thirdly yet a more vehement Irritation, and preternatural, is wont to be caused, from disagreeing, and disproportionate Aliments, also from Medicines and Poysons, the last of which but one is a little farther particularly treated of.

Moreover the fleshy and moving Fibres of the Intestines, sometimes by reason of other more remote Causes are stirred up to solutive contractions of the Belly. For violent passions of the Mind or the Body do frequently introduce a *Diarrhea*, *viz.* in as much as the Spirits being placed among the ἐγκέφαλον or principal parts of the nervous appendix, being more notably disturb'd, forthwith making known their disorder by the Pipes of the nerves or the nervous shoots, to the Spirits inhabiting the Intestines, they provoke them into an excremental Convulsion. After what manner soever the irritation is made, contractions follow, for that the animal Spirits leap forth both from the tendinous border of the Mesenterie into the fleshy annular Fibres, and also from the tendinous Fibres of the outward Coat into the fleshy longitudinal Fibres, both which, whilst they so blow up and intumefie, they thereby do render them more short and contracted. It would be too much from the purpose, any further here to expound what parts the Mesenterie obeys in performing this Peristaltick motion of the Intestines; for besides that the tendons of the circular Fibres are rooted in the border of it, you are farther to be advertisd that in its Plane the moving Fibres do tend directly from the Centre to the Circumference, the office of which cannot be otherwise thought to be, than that they, according to the instinct here given, being there variously contracted

Part I.

What kind of motion the Intestines have.

Their instinct chiefly from the irritation of the nervous Coat.

From what causes the nervous Fibres are wont to be irritated.

By what reason contractions do succeed irritations.

Part I.

The outmost
Coat of the In-
testines.

tracted, do stir up the like contractions, either in these or in those parts of the Intestines.

We have not much to say of the outmost Coat of the Intestines; this having its rise from the *Peritoneum*, and being wrapped about the former Coats, since it is altogether thin and nervous, it is commonly esteemed to be only as a covering for the rest: but yet, as the Series of the longitudinal Fibres do immediately ly under this Coat, and that none of their tendons are any where else to be found, and that indeed this Coat is tendinous, we may very well suspect that the animal Spirits do leap forth of the nervous Fibres of this, for the contractions of those fleshy Fibres, and that the Convulsion ceasing, they return back into these.

The Vessels and
Pipes belonging
to the Intestines.

The Vessels and Pipes, which belong to the small Guts, are the Vehicles either of the Spirits, or the Humours, of the former sort are the Nerves and their enfoldings and shoots, all which we have largely enough unfolded in our Neurologie. What belongs to the other leading Pipes, they are such as either carry the Humours to the Intestines, as the Choler-carrying and Pancreatick Passage, and the Arteries; and after a fort also the Nerves (as we have shown in another place discoursing of the Colick) or such as do carry away the Humours from these Inwards, as the milkie Vessels, and the mesaraick Veins. Everyone of these Pipes, and also the Spirits, and Humours that flow in them, and moreover either what are contained in the cavities of the *Viscera*, or that remain in their nervous or fleshy Fibres, are either Subjects, or Objects of Evacuation, and are wont first and immediately to be affected by all manner of Medicines, but after what ways, the Knowledge shall be designed in the particular of every kind of Evacuation.

Concerning the biliarie Passage, and the Pancreatick Pipe, for as much as so many Authors have already spoke very much of them, and notwithstanding the Truth may yet ly hid, or remain ambiguous yet (since there is a necessity that it must be very prolix and intricate) this will be no opportune place to enterprize the disquisition. What Vomits and Purges act in these parts shall be shown hereafter,

Innumerable
Blood-carrying
Vessels belong to
the Intestines.

As to what appertains to the Sanguiferous Vessels, the observation is common, that very many Arteries and Veins do branch themselves forth thorow the whole Mesenterie, and from thence distribute to all the Intestines innumerable Suckers. Concerning which we shall further advertise, as they are inserted into the outer Coat, a few Suckers only hang to this, but the greater branches, almost all of them presently hiding themselves within, do run back to the inmost Coat in which they terminate, and do send forth on all sides infinite and exceeding small Shoots, which very thickly hide its Superficies.

The use of them
inquired into.

But it may cause a wonder wherefore that there should be in these almost bloodless Inwards of themselves, so great an afflux of Blood designed. It is not unlikely that this is only done for the dispensing of the heat and nourishment, when as the Muscles and the outward Coats of the Intestines are contracted with fewer Vessels, there had need be the greater plenty in these. *Mebius* that he might loose this Knot, affirms that Nature had given so great plenty of Arteries to the Intestines, that the excrements of the Mothers Blood whereby the Embryo is nourished, at that time might be carryed away to the Intestines. The reason of which he ads for that the Intestines of the Embryo or Infant being newly born contain a black Excrement. But truly this Argument easily falls if we grant (as it is likely) with *Harvie* and our late Writers, that the Embryo sucks and receives a nutritious Liquor in at the Mouth in the Mothers Womb. But it may rather be said, that these Arteries do purge away the Dreggs of the Blood in adult living Creatures, oftentimes by the Intestines as a Sink, the unnecessary being carryed away by digestion and by other ways: and in the mean time the Veins receive a certain portion of the Chyle, and presently mix it with the Blood.

Of the thick In-
testines.

There will be no great need to speak here much of the thick Intestines, as to what appertains to evacuation, because that the Virtue of Medicines taken in at the Mouth is almost exhausted, before they can come into these Inwards, so that the irritation of these arise partly by a consent of the superior Intestines, and partly by their contents being violently disturbed, rather then from the Medicine

cine it self. They have the same Coats as the small Guts; and as the *faces* ascend strait into the *Colon*, there is need of more strong fleshy Fibres, which make a strong motion of contraction. Hence if there be an Inflammation or *Sphacelismus* (as I have often known,) about the beginning of the *Colon*, so that the fleshy Fibres being hurt that they are not able to make the Contractions to lift the *faces* upwards, they flowing back towards the *Ileon*, do cause the incurable Iliack Passion. Moreover in this Intestine those champered coverings or Caverns are added, that the *faces* being the longer detained in the Belly, the trouble of often letting them forth may be taken away. The Evacuation belonging to this Region, consists chiefly in Clysters. In some the interior Coat of the *Colon* is so very tender and sensible, that by reason of a Clyster injected, although to ease Pains, presently the Spirits growing hot, and being thrust forth among the nervous Fibres, they hugely put up the membranes, and distend them, so that they excite great trouble through the whole *Abdomen*. What we have now delivered concerning the Excretory motions of the Inwards, depending upon the contractions of the fleshy Fibres, will be better manifested, if our Hypothesis be consulted of the fashion and motion of the Muscle not long since published. As for the rest, for the more clear illustrating of the Anatomie of these parts, we have taken care to add here the Figures of each of them most exactly, and to the Life delineated by a most skillful Artist, and although in the description of the Ventricle with the *Oesophagus* and Intestines, we have followed *Fallopious* and others both Ancient and Modern, and have assigned to every one of them only three Coats; yet by the separation of these (after their being immersed in hot Water) being a little more accurately made four distinctly appeared. For the hairy Crust, which some have esteemed only an addition to the nervous Coat, is a peculiar Membrane, thick enough of it self, and for the innumerable little Glandulas with which its exterior superficies abounds, may be properly called the Glandulous Coat, as may manifestly appear by the Figures.

Part I.

The Iliack passion often comes by the Inflammation of the Colon.

THE

THE EXPLICATION OF THE FIGURES.

The first Table represents the Ventricle of a Man with its Vessels strutting with Blood, emptied, and blown up that all the Arteries and Veins with their Ramifications (which are truly and most exactly delineated) may be seen.

- A** *The Oesophagus.*
B *The Mouth of the Ventricle, nigh to which the motricious upper oblique Fibres, for the sudden opening and shutting of it, appear streight.*
C *The Orifice of the Pylorus with the Duodenum hanging to it.*
DD *A Portion of the Duodenum whose fleshy Fibres more thick in that place, appear under the outmost Coat.*
FF *To C: The Den of the Pylorus.*
GG *The top of the Ventricle, where the sanguiferous Vessels being inserted, do flow downwards, and disperse on all sides their Branches and Shoots.*
HH *The bottom of the Ventricle in which the sanguiferous Vessels ascending upwards are inserted, and disperse most thickly on all sides their little Branches and Shoots.*
III *The mutual Embracings and wonderful communications of the Vessels of either insertion.*
KL *The right end and left of the Stomach.*

The second Table expresses altogether the outmost nervous Coat of the humane Ventricle, whose nervous Fibres being carried the length of it, do cut the underlying exterior fleshy Fibres almost in right Angles.

- A** *The Oesophagus in whose exterior Coat all the nervous Fibres descend in a right Line cutting the underlying fleshy fibres obliquely.*
B *The Mouth of the Ventricle.*
C *The Pylorus, with its Den.*
E *A part of the Duodenum thereto hanging.*
F *The top of the Ventricle, where the blood-carrying Vessels appear thickly planted.*
GG *The slender and nervous Fibres stretched the whole length of the Stomach from one Orifice to the other, and beyond either.*

The third Table exhibits the humane Ventricle naked without its outward nervous Coat, that the exterior or Convex superficies of the middle Coat with its fleshy Fibres may appear.

- A The Mouth of the Ventricle, to which the Oesophagus *aaa* is joyned, and which the fleshy circular Fibres *b b b* do compass about, and as occasion serves being contracted, do shut up.
- B The Pylorus with the Duodenum thereto hanging.
- C The Orifice, and Den of the Pylorus, either of which the circular Fibres, whilst they are contracted do straiten, and (as you may see) shut up.
- DDD The circular Fibres compassing about the Ventricle in its depth or Profundity.
- EEE The Top or height of the Ventricle where those Fibres arise, whilst they are contracted upwards towards it, they cause the whole joyning of the Stomach to be very much streitned.

The Fourth Table whose first Figure shews the Ventricle turned inside out, with the interior and concave Superficies changed into the exterior and convex, that the hairy Crust, with its Wrinkles and Folds covering the Stomach, may be seen.

- A The left Orifice, or the Mouth of the Ventricle.
- B The Den of the Pylorus in which the thicker Coats exist.
- C Its Orifice to which the Duodenum is knit.
- DD The top of the Ventricle, or height between the Orifices.
- EEEE The sides, end, and bottom of it in which the hairy Crust of the interior Coat and the Wrinkles and Furrows in it are expressed to the Life.

The Second Figure represents a Portion of the nervous Coat in which the hairy Crust being taken away, the interior or concave superficies, with the most thick Ramification of the Vessels appears.

The Third Figure shews a Portion of the hairy Coat, or glandulous, in which its exterior superficies whereby it sticks to the nervous Coat replenished with glandulas and little Mouths of the Vessels, is beheld.

The Fifth Table shews the interior superficies of the fleshy Coat, and the concave inverted or turned outwards that one of the Series of the moving Fibres may be seen.

- A The Mouth of the Ventricle, near to which the Series of Fibres is seen to arise, partly forward in straight Lines, and partly carried in oblique Lines.
- BBB A manifest company of Fibres, which compassing about the mouth of the Ventricle run along its top to the Pylorus, and covering the length of its Den do terminate in its Orifice.
- D The Orifice of the Pylorus.
- E The Den of the Pylorus.
- FFFF Other fleshy Fibres, which tending obliquely from the left side of the Stomach towards its right, descend down to its Bottom.

The Sixth Table represents all the Coats of the small Guts separated one from another, that the nervous Fibres with the Glandulas and Ramifications of the Vessels, also the orders of the moving Fibres may be clearly and distinctly observed.

- AA Exhibits the outmost Superficies of the whole Intestine whose most slender nervous Coat with its most slender nervous Fibres round it, as may be seen, appears stretched out.
- BB The exterior superficies of the fleshy or middle Coat, which, the others being taken away, with the Series or its order of longitudinal moving Fibres is plainly seen.

D

CCC

Part I.

CCC The annular or circular Fibres of the same Coat, which, the first Series or order being taken away, manifestly appear.

DD The interior nervous Coat, whose interior Superficies, the hairy Crust being taken away with its thick ramification of Vessels, is exposed to sight.

EEE The exterior or convex Superficies of the hairy or glandulous Coat, by which it sticks to the nervous Coat, with the glandulae and most thickly planted little Mouths of Vessels, is shown.

SECT. II.

S E C T. II.

C H A P. I.

Of Vomiting and of Vomitory Medicines.

HAVING after this manner laid forth the Stage for medicinal Action, or at least briefly shadowed forth its first Circle, it now is incumbent upon us to describe the several kinds of medicinal Operations, the reasons of them, and the ways of their Affecting. Therefore we will inquire from the beginning what is acted in the first *Stadium*, to wit, in the Ventricle, and how vomitory Medicines do work. Where in the first place it behoves us to explain, what kind of Affection Vomiting is, also for what cause, and upon what occasions, either according or besides Nature it is wont to be excited. Then in the second place shall be shown upon what Parts, or Spirits inhabiting them, or the warty Humours, and after what manner Medicines, while they provoke to Vomit, do operate,

As to the first, when any one is affected with Vomiting, he may perceive in himself the Bottom of the Ventricle to be drawn upward, and the upper Orifice to be opened, and in the mean time (as it seems) the *Pylorus* being shut fast, or drawn inward, by an inverted motion at the same time the whole Pipe of the *Oesophagus*, to wit, from the Bottom to the Top, to endeavour as it were with a certain kind of pumping, that what is therein contained may be thrust up higher, and at last cast forth at the Mouth. These kinds of motions of these parts, are made without doubt by the fleshy Fibres which compose the middle Coat of the Ventricle. For we may perceive in this Coat, two distinct Orders of fleshy or motional Fibres, which compass about the Stomach thorow its whole dimensions, and being together contracted, they gather close its Bottom and Sides, draw them upwards, and incline them either towards this or that Orifice; for that the Contents may be cast forth at the door, sometimes at this, sometimes at that. As to the interior Fibres, which determine the contractions of all the rest either to this or to that Evacuation; if there be any where made about the Bottom or Sides of the Stomach, a gentle irritation, the Convulsion begins towards the *Pylorus*, and the internal moving Fibres are at their right Ends first and soonest contracted, the whole joining of the ventricle being there contracted, it pours forth its loding into the Intestines: but if the irritation be vehement, and very provoking in any part of the Stomach excited, it will not be easily restrained or transferred towards the Intestines, the Convulsion beginning towards the left ends of the interior Fibres, and leading towards the Mouth of the Ventricle, it makes there the whole Capacity of the Stomach being extremely straitened and contracted, to be drawn up together; so that the *Pylorus* being drawn inwards and shut fast, and the Mouth of the Ventricle open, what ever is therein contained, is cast out upwards. The same fleshy Fibres, as the animal Spirits variously stirred up do leap forth out of these or those Tendons first, in the right or left ends of them, there they begin their Convulsions, and are determined to provoke to Stool or to Vomit respectively. Moreover whilst that the Ventricle is disposed after the aforesaid manner to the upper egestion, the *Oesophagus* conspires also in the action for the casting forth its Contents upwards. And for as much as we have noted in the fleshy Coat two double orders of moving Fibres, of which one of them ascending obliquely, the other descending, they all mutually do cut one another; the Office of the former seems to be, that they in straining to Vomit being one series after another contracted, may shut up the

How the Ventricle and Oesophagus are affected in Vomiting.

By what fleshy Fibres the Emetick Convulsion is performed.

Part I.

Vomiting or a
convulsive mo-
tion.

How Vomiting
differs from o-
ther Convulsi-
ons.

The Conjunct
cause of Vomi-
ting.

By what reason
the Spirits are
stirred up in
Emetic Convul-
sions.

Throat behind for the casting forth of its Balast, and so cause it to be forced to that gaping of the Mouth.

Vomiting therefore, for as much as it is a violent motion of the Stomach, and very often involuntary, it is not undeservedly called Convulsive; which further we do affirm to proceed from the Explosion, or a certain great Expansion (according to our Spasmologie deliver'd in another place) of the animal Spirits, which possess these fleshy Fibres. For truly these Spirits being highly irritated and then presently bursting forth, they first of all rush impetuously from the Tendons planted near the left Orifice, and then presently out of others into the fleshy Fibres, and highly inflate and abbreviate them, so that the whole parts of that Coat being brought nigh together one after another, the whole Cavities of the Stomach being straitned, and folded together, and so contracted upwards towards the left Orifice, it drives forward or more upward as it were with the stroke of a Bolt, whatsoever is therein contained, that it may be bolted forth by Vomiting.

In most of the other kinds of Convulsions, the convulsive motion is wont to be made towards the same limit as the natural: but Vomiting seems to be an affection contrary or at least opposite to the ordinary and natural Action of the Stomach. For it is its solemn and almost constant gesture, the whole or its parts, to be drawn downwards, or towards the *Pylorus*: for there is need of such a motion and of its tendencie, whereby the aliment swallowed down may be able to descend into the bottom of the Ventricle and there to be more straitly pressed, to be rolled from side to side, to be digested into Chyle, and at length to be transmitted to the Intestines. Therefore for these uses the moving Fibres of either order being inflated by the gentle incursion of the Spirits they easily compose the Ventricle after that manner which the instinct of Nature suggests.

But if any Irritation happens to the nervous Fibres of the Stomach, whilst the hurt is but small and easily removed, the expulsive Contraction is begun rather towards the *Pylorus* than towards the Throat: but in Vomiting the Convulsion of the moving fibres beginning at the other ends of them, viz. the left ends, and straitways becoming violent and impetuous compels the whole Cavity of the Stomach collected together, and greatly straitned, to be drawn up, and to be evacuated that way. The reason of which is, that if there be any thing very troublesome and disagreeing to Nature settled in the Stomach, it ought not be carried about the ordinary way, by the long *ambages* of the Intestines, that it might be at last expelled at the Fundament; but to be cast out by a more near *exit*, and that out of hand to be sifted out, lest by its stay it might cause an incurable disease. Besides, when very great grief happens in other parts at a distance from the Ventricle, lest that, whilst Nature is busied about them, the Stomach (where is the first Enkindling of Life) should receive any hurt, oftentimes for its greater safety Vomiting is excited by a consent. So that it is provided by the deep providence of the Divine *Architect* for the more certain custody of the humane Body as it were a Tower, as often as as an external Enemy shall invade, or that a sedition shall arise among the proper Inhabitants, forthwith, whatsoever Guests, as persons suspected, are cast forth at the nearest Passage, to wit, the Gate of the Ventricle.

Therefore the next or conjunct cause of Vomiting is a sudden and vehement Explosion of the animal Spirits seated in the fleshy Coat of the Ventricle, by which indeed they are very much irritated, and then expanded, and rarefied, as they leap impetuously from all the tendinous Fibres, and then first and chiefly from those that are placed near the Mouth of the Ventricle, into the fleshy Fibres, so that they suddenly blow them up, and abbreviate them, wherefore as the Sides and Bottom of the Stomach being of course brought near together, and all together snatch'd upwards towards the left Orifice, they cast forth what ever is contained therein to the Pipe of the *Oesophagus*; from whence (when as its contraction from the Bottom to the Top immediately follows) it is carried forth at the gaping of the Mouth.

These sorts of Spirits begin the emetick Explosions, because they are highly irritated: but after what manner that is done we have shewn in our Tract of convulsive Affections; for that they being highly endued with an Elastick Nature, from a certain *ορμαίνων*, yea sometimes they leap forth of their own accord by reason of some heterogeneous joyning together, and impetuously fling themselves forth

forth on all sides. But for what causes and by what means it happens that they are so irritated, we shall inquire anon. In the mean time it may be observed that the Spirits inhabiting the Fibres of the Stomach do exist in some more thick and firm, that they are not, unless by a more strong irritation, agitated into an emetick Explosion; but in others they are either more subtil, or too much elastick, that from a light occasion they are incited to a vomitive Convulsion. Moreover when any thing hurtful or molesting afflicts the fleshy Fibres of the Stomach, a Convulsion is excited in these towards the *Pylorus*, in others it is more readily carried towards the Mouth of the Ventricle, and from thence either Vomiting or Purging proceeds.

As to what appertains to the more remote causes of Vomiting, of which number are whatsoever do much or grievously irritate the Spirits seated in the fleshy Fibres of the Stomach: which truly happens to be done after very many ways, we shall reduce them to some certain Heads. And in the first place may be referred hither impropportionate objects approaching the interior and nervous Coat of the Ventricle or rather the Spirits inhabiting it; for this being hauled, oftentimes provokes the other lying over it into emetick Convulsions. These Provocatives are either taken in at the Mouth, to wit, disagreeing Food, Medicines, or Poysons, or else a Matter begotten in the Ventricle, or lastly brought thither from afar by the Arteries and the Nerves; or in the second place the Spirits inhabiting the fleshy Fibres of the Stomach are irritated by reason of some trouble from other Spirits at a distance inflicted here or there, and communicated from thence to the Ventricle by the Pipes of the Fibres or Nerves. Vomiting excited after the former manner, may be called the proper affection of the Ventricle, and this latter to be done by consent. We shall note some Instances of all of these.

In the first place therefore an irritation made in the interior Tunicle, of the Ventricle provokes Vomiting before any other cause whatsoever. For this part being nervous and very sensible of impressions from all things contained in the Stomach and according as these are either pleasant or grievous, the fleshy overlying Coat is stirred up to the motion of embracing or casting off; and as to the latter of these, as the impropportionate object is more or less troublesom to Nature, either Vomiting or Purging is stirred up. Further in this Coat of the Stomach there seems to be placed some peculiar sensibleness, both as to the touch and to the taste distinct from any other thing in the whole Body. For truly when Medicines, or some Aliments, as *Stribium*, *Mercurius Vita*, the Flowers of Antimony, the Spawn of the Barbel, with many others being chewed in the Mouth, they have caused no trouble to the Sense, but these being sunk down into the Stomach, how cruelly do they irritate this Coat, and quickly stir up most grievous Convulsions. Moreover if any one should swallow down, though unknown, a small portion of disagreeing Aliment by Antipathy, though it be never so small, cover'd over with other Meats, and hid as it were with a Mask, it is known by the Stomach, and as if he were an Enemy entred clandestinely, he is immediatly by an excited force cast out of doors. The emetick provocatives taken in at the Mouth are either Medicines, the reasons of whose actings shall be given hereafter, or Poysons, which produce that effect, for as much as they being of an infestous nature, do at the first touch overthrow the Stomachal Spirits, and bring them as it were into a Furie, or in the third place Aliments of which there is enough commonly known, for if they offend in a manifest or occult quantity, or in quality, or in the manner of taking them, or are impropportionate to the Stomach, they for that cause do not rarely stir up Vomiting.

Secondly, the emetick Matter is sometimes begotten in the Ventricle; to wit, when the things taken in are not in fault; and when the Chyle or fermentative Juice of the Ventricle degenerates into a sharp, austere, or bitter, or otherways infestous Humour, and for that cause irritative, as it very often happens in Cholerick and Hypochondriack persons.

Thirdly, nor is this provocative Humour less frequently poured into the Ventricle, from another place: for besides that Choler, and (as some are of opinion) the pancreatick Juice, sometimes singly, and sometimes together, being emptied into the Stomach, mutually striving and boyling up do provoke its Fibres into vomitive Convulsions, there is moreover an heterogeneous Matter translated hither by the Arteries, which oftentimes stirs up very great Vomitings; so it very often

Part I.

The more remote causes of Vomiting.

Vomiting in respect of the Ventricle is either Idiopathick or Sympathick. The former proceeds from the irritation of its nervous Coat.

The emetick Irritation.

The emetick Matter.

1. Either taken in at the Mouth.

2. Or begotten in the Ventricle.

3. Or is poured in thither from another place.

Part 1.

often happens in the Paroxysms and Crises of Fevers, and especially in the Plague, and small Pox. Sometimes the sanguineous mass boiling up, not being indeed able to expell its superfluities by the διαπνοήν or Perspiration, it pours it forth by the branches of the Cœliack Arterie, and by the cavities of the Ventricle and Intestines; so that their Coats being notably hauled they suffer horrid Vomiting, and also dysenterick Passions; also the Vomitive matter seems not only to descend by the Arteries but sometimes also by the Nerves. Hence very often the Colick arises as we have clearly enough shown: But truly I have observed in many (who have been obnoxious to convulsive Passions) after a short Headach, with heaviness, and Vertigo, that a vomiting affection hath followed: that they returned back by Vomit what they have daily taken in, without any notable impurity of the Stomach. The matter so poured forth by the Arteries or Nerves upon the Coat of the Stomach, so it be loose and easily to be dissipated, is quickly shaken off again, so that the Affection soon passes away, but if it be more fixed and adhering more pertinaciously to them, yea sometimes growing into Humours of various kinds it induces a daily vomiting disposition, and not easily curable.

Sympathetick
Vomiting or by
consent.

So much of Vomiting, whose material or irritative cause being placed somewhere about the internal superficies of the Stomach, and affecting the nervous Fibres by a naked touch, stirs up the Spirits inhabiting in the fleshy Fibres into emetick Explosions. There remain very many other species of Vomiting, in which an irritation is made in other places, and presently the Stomach is stirred up to Convulsions by consent: For indeed as there is so much alliance, and mutual dependency between this Inward and most of the other parts, it often happens, by reason of some of the animal Spirits somewhere very greatly disturbed, that by and by the other Spirits that reside in the Ventricle, either by the continuity of the Fibres, or by the passage of the Nerves, come to be in like manner affected, and to be driven into vomitive Explosions.

By the consent of
what parts it is
stirred up.

The places of this sort of Sympathetick Vomiting are either more near, to wit, both the Orifices of the Stomach with the *Duodenum* and the *Oesophagus*, or more remote, viz. the ἐγκεφάλῳ, and *meninges* (or thin Skins about the Brain and Heart) as also the Spleen, the Reins, the Ureters, Mesenterie, the Matrix, and perhaps other Inwards of the *Abdomen*; in one of which, or many of them together there being excited a Convulsion, and from thence communicated to the Stomach by the Pipes of the Nerves, it stirs up its fleshy Fibres into emetick Contractions. In like manner when the animal Spirits in the Head are very much disturbed, their disorder by and by doth effect by consent those other inhabiting the Ventricle, and stirs them up into the like Convulsions or ἀταξίας: we will note some instances of each of these, with the reasons of them.

2. Either Orifice
being affected.

In the first place either of the Orifices or doors of the Stomach, as they are very sensible by reason of the manifold Insertions of the Nerves, they are easily irritated; and for that cause being brought sometimes inwardly sometimes outwardly, and variously expanded, or shut up, they excite excretory Convulsions in the whole Ventricle, tending either upwards or downwards. There is nothing almost in it self but that that it is sensible of, and the acid or bitter Humours fluctuating in the Stomach, and biting the left Orifice do provoke a Nauseousness and Vomiting. No less is the same effect produced by the flowing of the *Bile* into the *Pylorus*.

Vomiting from
the Pylorus be-
ing affected.

It would be too much from the purpose to relate the Dreams of *Helmont* of the dignity and dominion of these parts; he affirms the left Orifice to be the Seat of the Soul, and the right, to wit, the *Pylorus*, of the Appetite, and to be the shop of the other Passions merely natural; besides from its indignation, and obstinate shutting up, horrid Vomiting to proceed. Although we do not at all assent to these; yet by reason of this Door's being too much shut up, that Vomiting and other evil affections of the Stomach do arise, the following Histories will declare.

An anatomick
Observation of
this.

An illustrious young man, being a long while Cachectical, and labouring with often Vomiting, and that dayly for many Months and almost continually, at last his strength being quite worn out he dyed. The Carcase being opened I found the *Pylorus* full of *Scirrhi* very tender, and sensible Pimples, round about, which had almost shut up its Mouth; so that the Chyle getting between the space of the Nodes, did extremely putrefie, and for that cause the whole Inward was almost

most continually affected with a most troublesome Sense, and Convulsion. No less will a very rare case of a certain Man of *Oxford* shew, an almost perpetual Vomiting to be stirred up by the shutting up of the left Orifice. A strong Man, and otherwise healthful enough, labouring for a long time with often Vomiting, he was wont, very often, though not allways, presently to cast up whatsoever he had eaten. At length the Disease having overcome all remedies, he was brought into that condition, that growing hungry he would eat until the *Oesophagus* was filled up to the Throat, in the mean time nothing sliding down into the Ventricle, he cast up raw (or crude) whatsoever he had taken in: when that no Medicines could help, and he languished away for hunger, and every Day was in danger of Death, I prepared an Instrument for him like a Rod, of a whale Bone, with a little round Button of Sponge fixed to the top of it; the sick Man having taken down meat and drink into his Throat, presently putting this down in the *Oesophagus*, he did thrust down into the Ventricle, its Orifice being opened, the Food which otherwise would come back again; and by this means he hath daily taken his sustenance for sixteen Years and doth yet use the same Machine, and is yet alive, and well, who would otherwise perish for want of Food. Without doubt in this case the Mouth of the Stomach being always closed, either by a Tumour or Palsie, nothing could be admitted into the Ventricle unless it were violently opened.

No less frequently a Convulsion being excited, by reason of Irritations above this left Orifice, and below the *Pylorus* in its neighbouring parts, and propagated by the continuity of the Fibres into the Ventricle, it there stirs up emetick contractions. When in the swallowing down of Food by the Pipe of the *Oesophagus*, it sticks by reason of a Palsie or Obstruction, and stimulates the nervous Fibres, presently the fleshy Fibres being contracted upwards they also by a consent force the Ventricle into a Convulsion. The like effect at all times happens from the Palate and *Uvula's* being irritated. Hence very often an endeavour to Vomit, or vomiting is stirred up, from ingrateful Meat or Drink, almost as soon as tasted in the Mouth, also by a feather put down the Throat. For the same reason also in the Pthisick sometimes a Vomiting accompanies, or follows the vehement Cough; to wit, throw the hauling or concussion of the same Coat, which in like manner covers the Throat, and the top of the wind-pipe. In like manner in the lower appendix of the Ventricle, viz. in the Intestines, if that any trouble happens any where with a Convulsion, oftentimes that affection, by the Continuitie of the Fibres creeping upwards, provokes Vomiting. For this reason Vomiting is excited in the Choleric Disease, Iliack Passion and other Torments of the Intestines. Hence also some whole *Viscera* are very tender in taking of a Glister constantly Vomit. It were easie, to heap up very many Instances of this kind, but we will pass on to other causes of Vomiting.

3. Besides these now mentioned ways in which an irritation is made in the Ventricle itself, or in its appendix, it sometimes happens that the Stomach, guiltless and well enough of itself, suffers through default of other parts seated at a great distance; which is not done by the great continuity of Fibres, but by the Passage or Commerce of the Nerves. For truly by the leading Pipe of these, when that the Animal Spirits are disturbed in one place, others dwelling afar off they receive the like irritations and fall into contractions: hence from a wound or grievous blow upon the Head, for as much as the Spirits within the *Encephalon* being disturbed; by the passage of the eighth pair of Nerves, they stir up the others residing in the Ventricle into the Convulsions, Vomiting frequently follows: for the same reason, some being in a Ship, or riding in a Coach are troubled with huge Vomiting. The cause of which Sickness is not by any means (as some affirm) the agitation of the Humours; but truly the Animal Spirits inhabiting the Brain, being compelled into inordinate motions, they fall tumultuously upon the beginning of the Nerves, and by their leading Pipe stir up the emetick contractions of the Inwards. In the mean time the Matter cast out by Vomiting, is mere choler, which is by reason of the former Convulsion powred forth by the Choler-carrying Vessels; so far is it that it should be the primary cause of Vomiting. Further when that the Stemms out of the Trunk of the same eighth pair of Nerves and the inferior Branches, disturbed in the peculiar Inwards of the *Abdomen* are irritated into Convulsions, other Stemms however untouched do not unfrequently receive the like disturbance, and they themselves impart to the

Part I.

Vomiting from the Mouth of the Ventricle being affected.

A notable case of this.

Vomiting.

The Sympathic cause of Vomiting in the Oesophagus.

Also below the Ventricle in the Bowels.

The cause of Vomiting sometimes in the Head.

In the remote parts of the Abdomen.

Part I.

the other Inwards. and chiefly to the Ventricle, convulsive Motions. This of Vomiting is manifest for that it is stirred up in Nephritick Paroxysms, also in the Passions of the Colick, and hysteric Affections so called.

How the emetick Medicines do operate.

Thus far of Vomiting in general, and of its subject, formal reason, causes and various manners of doing it, in which hath been shown, that this affection is altogether stirred up by the Spirits inhabiting the fleshy Coat of the Ventricle being highly provoked, and drawn by their acting into convulsive Explosions, and they for the most part and chiefly into that sort of contractive Motions, by reason of the troublesome sense impressed on the interior nervous Coat; besides that those irregularities of the Spirits so affected, by reason of the Spirits being disturbed in other places, do communicate by the continuity of the Fibres, or the Pipe of the Nerves, their disorder to the Ventricle. These things being premised, it remains next that (as it was in the second place proposed) treating of vomitive Medicines, we do shew by what manner and by what sort of strife they operate in the Ventricle, and other parts of our Body.

Concerning these it is very obvious to conceive, that Vomits being taken in at the Mouth, and received into the Ventricle, do at the first irritate its interior nervous Coat, and press on it a sense of the trouble, and afterwards by the instigation of this the over-lying fleshy Coat is affected, and stirred up to excretory contractions for the casting off this Grief. But truly as to the manner of irritation and the ways of excretion, there are some differences, and the reasons of them are not very manifest.

For first of all when that cathartick Medicines, being taken into the Stomach do provoke its fleshy Fibres into exterior contractions, from whence comes it, that from these more often and rather Vomiting is stirred up, and from those purging, not indifferently either?

2. Further concerning those which for the most part and almost constantly move Vomiting it is to be observed, a certain Energie either in the manifest reason of its working, to produce that effect, as when that which is taken is truly ingrateful in taste, in smell, or any other sensible quality, or that they offend in quantity; and moreover some Medicines, to be given, being more properly and specifically disposed for Vomits, the emetick Virtue of which is altogether hid from our senses, only it betrays it self by manifest effects in the Stomach. The solutions of these will make very much to the well building up of Emetologie.

Vomitory Medicines from Catharticks differ, are either.

1. As to the first, that such a Medicine should rather operate by Vomit, than by Stool, that ought to consist in the particles of it, which, as they are deadly or at least disagreeing to Nature, besides that they may be so as to the quality, or quantity, that neither may indeed be overcome by the Stomach; neither may they be able to be suffered by it so long until being scoured off by little and little from the Fibres or little Strings, and together with other Juices leisurely and by Parts be cast out by the *Pylorus*. But truly because they either do more severely haul the Fibres of the Ventricle, or adhere more pertinaciously to them, or do aggravate it by their motion, and distend it, presently the fleshy Fibres prepare for excretory Convulsions, and then by the instinct of Nature, they are rather contracted after that manner, by which they may send forth a doors that which troubles them with the greater force, and by the shortest Exit. How the fleshy Fibres are moved in order to Purging, we shall declare hereafter.

Emeticks which are either gentler or stronger.

2. As to what respects the distinction of Emeticks, and the divers reasons of their working, they are commonly understood to be twofold, viz. more gentle and more strong; the former of which do bring into open view their emetick Force, and bring forth their irritative Power by manifest Marks: as when the Decoction of Hyssop or Carduus, or the infusion of Sea Onion or Radish Roots, or a solution of Vitriol, warm Water or honied Wine or such like be plentifully drank; which even at first sight move the Stomach with the taste, they are forced to a striving to Vomit: those being exhibited, that Vomiting might follow, oftentimes an irritation of the Palat or Throat is said to be supplied, secondly the more strong Emeticks, (and which more properly belong to this Class) are Medicines of that sort, that if they be taken in due quantity they stir up Vomiting almost in all persons: of which are first of all white Hellebore, *Nux vomica*, Vitriol, as also the various preparations of Mercurie, which although proper enough

enough for the use of a Physician, yea although they are indeed very necessary, yet as to their Nature and Forces, in which the emetick Power consists, they seem to differ little from Poisons; wherefore if they be given in too great a dose, they do not rarely cause Death. By what course and after what manner of affecting, these do operate in the Ventricle and on the other parts of the humane Body, now indeed remains to be inquired into; we will first of all add the most notable *Phænomena* which do chiefly occur in this kind of Evacuation.

Antimonial Emeticks and other more strong being taken into the Stomach, are not wont presently (unless in such who before-hand loth them) to irritate, or to give a sense of their trouble; but afterwards sometimes sooner sometimes later, a nauseousness and perturbation is perceived, then a contraction of the Stomach, and ascending, with an opening of its Orifice and a leaping up of the *Oesophagus* towards the Throat follows; and presently after Vomiting; this being done, these *Viscera* sink down, and for a little time are quiet: but a little while after the inquietude of the Stomach, and nauseousness and the ascension of that, and of the Throat returns with Vomiting, and so the force of Vomiting, and ceasing from it, are often repeated by turns, until this operation ceases, the strength of the Medicine being wholly worn out.

At the beginning of Vomiting the Ventricle seems only to be contracted upwards, and not to be hugely provoked. Afterwards, its Convulsions are more vehement, and unfold themselves more largely, so that the *Duodenum* by an inverted motion, directs its contractions upwards, and whatsoever is contained in the Stomach (which is the intent of the emetick irritation) pours forth: if the irritation be yet further stretch'd, there not only follows Convulsions, but often times distentions, and puffings up, and the more dangerous Convulsions of the Ventricle, to wit, a yexing or hickcock: and truly by reason of the animal Spirits being disturbed in their whole *Systasis*, and sometimes too much dissipated or excited, frequent Swoonings, cold Sweats, and not seldom deadly Convulsions of the Members or of the whole Body happen.

A stronger Emetick being taken, when the Stomach begins to cast, first of all is cast out that which fluctuates in its Cavity, next whatsoever of viscous Flegm that sticks to its hairy Scurf or is hid in its Folds. If the Vellication persevere, the serous Humours are pressed forth of the little Mouths of the Arteries and Nerves; then the Convulsion being communicated to the *Duodenum* by its Pipes, the Choler and pancreatick juice being extorted from the Passages, they are carried forth and spread into the Ventricle. Hence the bilious matter for the most part is cast forth last of all, and then not seldom mere Bile is copiously vomited forth: which if it so happens, upon every turn of excretion, Pains being excited a little below the Ventricle on the right side do creep upwards; which without doubt proceeds from the Biles being thrust out into the *Duodenum* and from thence spread abroad within the *Pylorus* by reason of the convulsive Motion, and inversion of the Intestines. If that the irritation doth not yet cease, the Arteries (their little Mouths being highly irritated) do pour forth the Humours to be purged out, from the whole mass of the Blood.

From this History of Vomiting it may be lawful to conjecture, how and by what means an emetick Medicine doth operate, viz. this being immerfed in the Ventricle, mingling it self with the Humour which is contained in that place, and impressing its Tincture, by little and little is received by the hairy Crust covering the inward Superficies: from thence the nervous Fibres, framing the interior Coat, and sustaining this Crust, leasurely imbibe this virulent Tincture; with which when they are in part filled, they begin by reason of the incongruity of the Juice, to grow into Wrinkles, and to be greatly unquiet, from whence the overlying fleshy Fibres, being irritated because of the grief received from the nervous Fibres, they begin here and there up and down, the first lighter Convulsions; from whence comes a nauseousness and perturbation of the Stomach; and by and by the Spirits inhabiting all those of either interior order grow highly angry, and thrusting themselves forth they cause very strong and emetick Contractions, whereby that grief shook off from the nervous Fibres might be cast forth by Vomit: and when by this means these Fibres are freed from the medicinal Juice which they had drunk in, the endeavour to Vomit ceases for a while; until being again imbued with a new provision of the Virulent Tincture, which

Part I.

The more strong differ little from Poisons.

By what means they operate in the Ventricle.

And by what rite or manner they affect it.

What several sorts of matter, and of what kind, are cast out by Vomits.

The reason of vomitory Medicines and the manner of their working described.

Part I.

wherefore Emeticks operate by turns and intervals.

wherefore Vomiting is easily quieted.

The Humours being expressed into the Ventricle oftentimes increase the operation of the Medicine.

wherefore Vomitory Medicines work in some sooner or presently.

Vomitory Medicines in solid forms work.

Vomitory Medicines do not operate alike in every dose.

Vomitory Medicines are not induced with a specific Virtue.

they had then drawn from the hairy Crust they are provoked into the like trouble and emetick Irritation: and so often the force of Vomiting is repeated until the matter of the poysonous Tincture, be also cleansed from the hairy Crust and that it be at length wholly cast out a doors, and that the nervous Fibres of the interior Coat do not imbibe any more of that Poyson.

But indeed it doth not always follow that Vomiting doth therefore cease, although the Medicine be wholly cast out, and none of its Contagion left behind, for notwithstanding those Spirits of the Stomach oftentimes, being too much provoked they very hardly lay aside their Furie; so that they are irritated by any other Juice which the nervous Fibres drink in, and are agitated into emetick Convulsions, and also repeat them by frequent Fitts: wherefore then, that Vomiting might cease, there should nothing either of nourishing or of cordial Drink be taken into the Ventricle, but it must be appeased by sleep, and the application of an outward fomentation.

Further sometimes other Humours being expressed out of the Vessels, and poured into the Ventricle especially from the passage of the Bile, doth not only add strength to the Vomitory Medicine, but its operation being ended, they continue, to provoke the Stomach further, and to urge it into excretorie Contractions: yea its nervous Fibres drink in that yellow Poyson, not less troublesome than the emetick Tincture, excite Convulsions, and continue beyond the force of the Medicine, these frequent fits of Vomiting, for the thrusting away that grief. For this reason, when that Choler abounds, upon every light occasion it is sent into the Stomach: and very often by the most gentle Medicine a cruel Vomiting with horrid Symptoms is excited, for the appeasing of which it is convenient to exhibit an allwaging Glister, whereby the turgencie of the choler may be solicited towards the inferior parts.

But that sometimes Vomiting immediately follows the emetick being taken, when, to wit, the Medicine is scarce got to the bottom of the Ventricle, nor yet entred deeply into its Fibres, the cause is, either that the hairy Crust being in some part worn out (as it is wont in Gluttons, and great Drinkers) the nervous Fibres being naked are quickly and easily irritated, or because the phantasie, being averse to the Medicine, it first of all brings in a nauseousness, or lastly because the Stomach being much burthened with the putrefaction of the excrementitious matter, it was before hand prone of its own accord to Vomit. As to what appertains to the nervous Fibres which drinking in the emetick Tincture conceive a Sense of the Grief, whereby the fleshy Fibres are irritated into contractive Convulsions; they are indeed the same, which cause very much the hunger or barking of the Stomach, being emptie, and being dry, thirst; and being satisfied by the grateful Juice of the aliments, they communicate a complacency to the Ventricle, and a refection besides to the whole Body.

It is obvious enough to be understood when as they are wont to administer Emetick Medicines in a liquid or a solid form, how the former do come to an irritative plenitude. But yet as to the latter it is doubted by some and that deservedly, even by which way a very little Powder, as of Antimony or of the Flowers of Antimony, being taken in weight but three or four Grains, should cause so very great Vomiting; when from so small a Medicine, and not easilie penetrating, it should seem that these Fibres scarce in any part should be imbued, at least not so much as might suffice for an emetick irritation. For this we say that that Medicine given in a dry substance, is presently dissolved, and doth impregnate the Humour great enough in the Ventricle, so as by an Infusion made even of *Crocus Metellorum*, the Stomachal Fibres imbibe the dissolved particles of the antimonial Sulphur, and from thence are irritated into emetick Convulsions.

What is asserted by some that a vomitory Medicine given in how great a dose soever doth not operate more strongly, than if it had been taken only in a lesser quantity, is very far from the truth, and the experiment of this thing is not to be made without danger; for that if there be more particles of the Medicine, they also imbue the more Fibres, and entring more deeply into them, they more grievously provoke them, so that more cruel and frequent Convulsions must necessarily follow.

As to the vulgar opinion, that Vomitory Medicines do agitate the Humours upwards and sift them out through the upper parts by a certain specifick propertie, it seems

seems to be merely frivolous; for of what sort that Virtue should be, none hath been able to explicate, nor indeed to prove that there is in truth any such thing. In the mean time for the understanding of the Emetologie it will be enough to conceive that the particles of a Medicine very infestous to Nature being imbibed by the nervous Fibres of the interior Coat of the Stomach, do induce a great trouble to them; from thence that that Juice might suddenly and the nearest way be expelled again, the fleshy Fibres of the other Coat are irritated, and instigated into Emetic Convulsions. But that indeed is urged by some, that white Helibore applied to the Navel, and an infusion of *Crocus Metallosum* given glisterways doth move to Vomit, having often made the experiment I cannot find to be true. But if it should be so sometimes, why should not a violent irritation inflicted on the Intestines, at the same time stir up Convulsions and inverted Contractions, and afterwards secondarily and by consent Vomiting in the Ventricle? (by the like way indeed, this affection of the Ventricle, comes oftentimes in the colick, and in the Iliac Passion) one time, I injected into the jugular Vein of a strong Dog about six ounces of Wine impregnated with an infusion of Antimony; about five or six minutes after he began to reel, and falter in his going and afterwards to Vomit extremely. But we may suppose this effect to have been caused from the Medicine assaulting the Brain rather than the Stomach, when the like Vomiting follows after a Liniment or a Fomentation of the Juice or decoction of Tobacco applied to the Head.

Neither is that opinion built upon less trifling Foundations and as we judge, as far from the truth, which affirms certain vomitory Medicines to work upon choler, others on Flegm and others on Melancholy, and to bring away this or that Humour, search'd out and as it were whole from the rest. But about the choice to be made in Emeticks, the chief regard of the difference to be observed is, that in some griefs the more gentle are to be administered, which disturb nothing beyond the Ventricle, and do gently bring away only those things which flow about its Cavity, or adhere to its Coats: in other cases more strong are convenient, that by a Convulsion communicated also to other *viscera*, whatsoever excrements overflow in them, or is heaped up any where else, may be moved out of the Mine, and presently cast forth a doors either upwards or downwards. And for that sometimes a viscous Matter and as it were Phlegmatic is chiefly sifted forth, the cause is, for that the ballast of the Ventricle, the receptacle of the bilious Humour being unshaken, is almost only purged out, but when the choler-carrying Vessels are cleansed, the excretion comes forth the most part bilious. The Vomiting of a black Humour depends very much upon the Tincture of the Medicine, for vitriolated Medicines infect the out cast Matter with blackness.

Evacuation by Vomit as it is more violent than by Stool, so if there be strength to bear it, in some diseases it is more profitable or helps more than ten purgations. For by this means heavey Phlegm growing in the Folds of the Stomach, which all the other Catharticks slide besides, is purged away or cleansed as with a Broom, besides the neighbouring parts, the Pancreas, Mesenterie, Spleen, and Liver it self are moved by its strong Convulsion, so that obstructions made in them also, whatever stagnations there be of the Blood and Humours, are easily removed by this kind of Remedy. The extraneous Ferments begot every where in the Body, and also the more secret Seeds of Diseases are rarely extirpated without the applying of vomitory Medicines; but chiefly in the Diseases of the Brain and Nerves the use of Emeticks is esteemed very helpful, for by this kind of evacuation, not only the Filth of the Stomach and the Inwards, which pollutes the Chyle and Blood, is plentifully cleansed away, but also the Glandulas, which are the emunctories of the Blood, and nervous Juice, being placed in the *viscera* are squeezed, the Choler-leading Vessels, and other receptacles of the Excrements are copiously evacuated, for that the same being emptied they more readily receive the *Serum* and other Purges of either Humour, and the superfluities otherwise apt to restagnate into the Head: moreover, when as the innumerable little Mouths of the Arteries under the hairy Cruft do open into the Ventricle, this being by a vomitory Medicine notably hauled, they pour forth what vitious or malignant Humours are abounding in the Blood, and there by Vomit they are sifted forth, and therefore it is chiefly for this reason difficult diseases are best cured by Emeticks, and scarcely without them. For truly these Medicines should be of an untamable and active

They operate not on peculiar Humours.

From whence that vulgar Error arose.

The emetick Evacuation is it be convenient is more Efficacious than any other.

Part I.

But more Dangerous.

The Indication of the vomitory Medicine.

2. To whom permitted.

3. To whom prohibited.

The Division of Emeticks.

Nature, and not only squeez forth the superfluous Humours from the mass of the Blood by pulling and hauling the Arteries, but scatter abroad the Blood, by entering into the Pipes of the Veins, which there do gape and are innumerable, and do precipitate its serosities and other excrements and cause them to separate. But in the mean time this emetic Evacuation ought not to be used indifferently by all; For that in some the tone of the Ventricle is too lax and weak, and the constitution so tender that the Spirits immediately become faint with vomitory Medicines, and loose their strength: others again have *Viscera* of an immoderate and pertinacious Sensation, that although they are very difficult to Vomit, yet having once begun Vomiting it is not easily allayed, but with the very often endeavouring to vomit, they are brought to a great loss of their strength and to a failing of their Spirits.

Wherefore that the vomitory Medicine may be rightly exhibited, we ought to weigh, what are its Indications or Signs of the need of it, to whom to be permitted, and to whom to be prohibited. Emeticks seem to be needed, when the bilious and bitterish Humour fluctuates in the Ventricle, that from thence a nauseousness, an ingrateful savour, or short Headach do arise, also if the Stomach be burthened with a clammy Phlegm, as in the long disease of Maids, and in Men after Surfeiting, and inordinate Eating. In most cases when with difficulty of Breathing the Ventricle being full is affected with a Queasiness or Nauseousness, evacuation by purging is wont to be used. Further when the Stomach is pressed with an extraneous ferment that what soever is put into it is presently cast back again by Vomit, also by reason of far distant parts, Vomiting is not seldom used successfully: for by this means the Choler-carrying Vessels are very greatly emptied, that the Choler being plentifully powred forth from the Blood its feverish dyscrasie may be taken away. Furthermore, for as much as the superfluities or stagnations of the nervous Humour are most easily cured by the means of this evacuation; in the Gout, *Asthma*, Epilepsie, Madness, and very many other Diseases, which are accounted great and difficult, the use of Emeticks comes to be no small means of curing. Secondly they permit the taking of this Remedy, where there is strength of the *Viscera* and firm constitution of Body, and chiefly to these who have a more short Breast and Neck, and whose Mouth and Ventricle are not far distant: also the Laxity of the Matter to be purged forth, a ready separation, also an appeasing of Nature, and an intention or leisure to this work make for the facility of Vomiting. Thirdly they prohibit an Emetick where there is a difficulty of Vomiting or an unaptness found by a former experience, a tender and soft constitution of Body, a tall, and slender Stature, infirm Inwards, and briefly where there is a consumptive disposition, with an Ulcer of the Lungs, or spitting of Blood: also a too great Cachexie or evil disposition of Body in which there is danger, lest the Humours should be pressed forth from the whole Body into the Ventricle: also they exclude altogether this kind of Evacuation where there is an unwonted effervescency of the Blood, the Paroxysms of Feavors, and the expectation of the Crisis.

The Medicaments which are called Vomits are wont to be distinguished according to the force of their operating into gentle, mean, and strong: as to the matter out of which they are taken or prepared, it is out of the parts of Minerals, Vegetables and Animals: as to the savour they are very ingrateful to the Palate, as Vitriol, Tobacco, Roots of Bryonie &c. or grateful enough in Savour, as the Fruit of Mezereon, Indian Nut, the Spawn of the Barbel or Mullet, or else almost insipid, as the Flowers of Antimony, *Crocus Metallorum*, *Mercurius Vita* &c.

C H A P. II.

Prescriptions of Vomits, and the declaration of the Reasons of some of them as to their preparations and Chymical Analysis.

Take of Oxyssel of Squills $\mathfrak{z}\text{ij}$ of Wine of Squills $\mathfrak{z}\text{ij}$, mingle them and make a Vomitorie.

Take from 6 to 9 of the fresh Leaves of *Asarabacca*, Bruise them and put them into $\mathfrak{z}\text{ij}$ of white Wine, squeeze them forth, and take it with care.

Take of the Powder of the Roots of *Asarabacca*, $\mathfrak{z}\text{j}$ to $\mathfrak{z}\text{iiij}$ of Oxyssel of Squills $\mathfrak{z}\text{ij}$ mingle them and take it in a draught of Posset-drink.

Take of the Salt of Vitriol from $\mathfrak{d}\text{j}$ to $\mathfrak{d}\text{ij}$ or $\mathfrak{z}\text{j}$ let it be taken in a draught of Posset-drink.

Take of the infusion of *Crocus Metallorum* $\mathfrak{z}\mathfrak{ss}$ to $\mathfrak{z}\mathfrak{ss}$ or $\mathfrak{z}\text{ij}$ let it be taken in a draught of Posset-drink with governance.

\mathfrak{R} Of the infusion of *Crocus Metallorum* $\mathfrak{z}\text{vj}$ of the Wine of Squills $\mathfrak{z}\text{ij}$ of the Syrup of Vinegar simple $\mathfrak{z}\mathfrak{ss}$ mingle them and make a Vomitorie.

\mathfrak{R} Of the Sulphur of Antimony gr. vj to viii of the Cream of Tartar $\mathfrak{d}\text{j}$ mingle them, let it be given in the Pap of an Apple, or in a stew'd Prune or a spoonful of Grew-el.

\mathfrak{R} Of *Mercurius Vita* gr. iiij to vj take it after the same manner: so likewise are taken the Flowers of Antimony, or *Aurum Vita* or *Præcipitatum Solare*, and *Turbith Minerale*.

The Chymical Emeticks which are chiefly known are prepared first out of Vitriol, secondly out of Antimony, thirdly out of Mercurie.

Salt of Vitriol.

The Salt of Vitriol is prescribed after divers manners, viz. from elixivated Colcothar, out of blew Vitriol calcined, and washed according to *Angelus Sala*, and out of white Vitriol purified by many Solutions and Coagulations, which Medicine is commonly called the *Gilla* of *Theophrastus*, it is the safest and most easily prepared of them all; but the two first Medicines are notably Styptick, and as often as they have passed the Fire yet some Corrosiveness remains: but the last is gentle enough, it pulls the Fibres of the Stomach softly and makes it somewhat to wrinkle it self, so that, at last, that they might shake off the Grief, they fall into Convulsions and endeavouring to Vomit, which notwithstanding quickly pass off, and the perturbation of the Ventricle is presently appeased.

The Salt of Vitriol is therefore the more esteemed, because that it very rarely moves beyond the Stomach, neither like Stibiated Medicines causes the Convulsions of the Inwards and inordination of the Blood, or failing of the Spirits, but yet it hath a fault that it operates slowly, and sometimes scarce at all, wherefore when Vitriol is taken, there is need oftentimes of drinking good store of Posset-drink, to provoke Vomiting by a Feather put down the Throat, or to help it with Carduus Posset or Oxyssel of Squills.

Crude Antimony, the whole mixture remaining, works neither by Vomit nor by Emeticks.

Vitriolated Emeticks.

The Gilla of Theophrastus.

Its use.

2. Antimonial by Emeticks.

Part I.

Crude Antimony is no Emetick.

In what the Emetick Virtue of Antimony consists.

By what means its particles are made Emetick.

by Stool, the reason of which is because that the saline and sulphureous particles from whence the Emetick Virtue proceeds, being bound up in it, and being involved with others, they cannot put forth themselves; notwithstanding this Concrete being unlocked by a certain preparation, and somewhat loosened, those Particles being freed they are rendered ready for Action. But if it be inquired into whether the vomitive Faculty depends on the Sulphureous, or on the Saline Corpuscles? it seems to be of neither apart, but of both combined together: for when that those are given apart from these, as in the Tincture of Antimony, or these from those, as in its Cerus, no Vomiting follows. We have elsewhere taken notice that mere sulphureous or saline Particles tasted and smelt scarcely move, but both together conjoynd do strongly affect these Senses. In like manner we judge it to be with the peculiar Sense of the Ventricle, that even it doth receive great pleasure, and trouble from sulphureous Salts, and that in their grateful or displeasing Compositions both Cordials and Vomits do consist. *Stibium*, that it may be made an active Medicine, is wont to be prepared either by it self, as it is done in the Glafs, and Flowers of Antimony, or with Salts and that either with Salt Nitre, as its Crocus, or with fixed Salt, as its Sulphur, or with acid Salt, as its Butter, and that which is made out of it *Mercurius Vita*. There are more emetick Preparations of Antimony, but these aforesaid are of chiefest Note, and are most commonly used. Care is first of all to be taken that the Antimony, by which both these Medicines or any others are rightly prepared, be chosen pure and unmixed with Lead. As to that, besides the brightness and firmness of its Streaks, the most certain way of tryal is, that a little piece of the corrected Mass be Calcined with an equal part of Nitre, it is a sign of its Goodness, if it shall run into Liver and Dross, for otherways a part of it melts into pure Lead. By this means sometimes I have gotten out of one Pound of Antimony two Ounces of Lead.

1. Glafs of Antimony.

The Glafs of Antimony.

R^x Of the Powder of Choice Antimony as much as will suffice, let it be calcined in an Earthen vessel, work it till it hath left off smoking, and acquires an ash or grey Colour; the matter being taken away and enough subdued in the Crucible, let it be poured forth on a Table or on a Skin, growing stiff into a clear Glafs, it goes into a purplish Colour. The Dose of this Powder is from gr. iij to vj, of the infusion in Wine the Dose is ʒvj to x: it works strongly.

The Reason of its preparation.

The reason of the aforesaid preparation (as I think) is this. Antimony in the Calcining of it is so long agitated, that whilst the Sulphureous particles do copiously evaporate, the saline Particles, being apt to vitrifie may run together more thickly; which afterwards, whilst the Mass is melted by a strong fire, laying hold on the attenuated earthly particles, they easily grow together into Glafs: which by reason of some sulphureous Particles yet remaining growes red and becomes an Emetick. For indeed the *Stibium* is in a great part or altogether deprived of its Sulphur, to be disposed into Glafs, as it manifestly appears by this, for that the *Calx* or the *Caput Mortuum* that is left of the distillation of the Butter of Antimony, melts by fusion into Glafs; which notwithstanding is White and voyd of an emetick Virtue, for that all the Sulphureous Particles ascending had altogether left that Mass.

2. The Flowers of Antimony.

The Flowers of Antimony.

Take of Select Antimony and powder'd what you will, let it be sublimed in a Cucurbit with an Alembick or an earthen Vessel fit for this Work with a moderate Fire, either by it self or with Sand, or the Powder of Bricks, or Calcined Tartar mixt with it: the Flowers ascend Yellow, Citron Colour, and White, of which those that are White are Collected, and reserved for Use.

The reason of its preparation.

In this preparation the Saline and Sulphureous Particles of the Antimony ascend, the waterish and earthie being shaken out, and combine together; wherefore, when both the mineral Body is very much opened, and chiefly the active little Bodies

Bodies (the more heavy, which did blunt them being put away) are joyned together, this becomes a strongly Vomitive Medicine, and not very safe. Its Dose is *gr. ij, iij, iiij.*

Part I.

3. The Crocus Metallorum.

Take of picked Antimony and of the most pure Nitrealike ℥iiij , pounded asunder, and carefully mixed in a brazen Morter, and by flinging in a live Coal set it on fire, and it will burn with ratling Noise: at length the Mass being left somewhat reddish (which by reason of the Colour is commonly called the Liver of Antimony) is separated from the dross partly black partly white lying about it, and reserved for use. The Liver is given in substance to *gr. iij, iiij* or *v*; the Wine of its infusion from $\text{℥}\beta$ to ℥j or $\text{℥j}\beta$. This works well enough, and is the most used Emetick.

The preparation of the Crocus of Metals.

The reason of this Process is, that the Nitre be pounded, and mixt with Antimony as it were with common Sulphur, that both the mixtures might be easily fired, for that both the Particles, to wit, the nitrous and sulphureous being requisit to or fitted for ny accension or burning do copiously and intimately come together or agree. By this conflagration the mineral Body is sufficiently opened, and its Particles loosened one from another, and although a certain proportion of the Sulphur flies away, there is however enough left that combined with the Salt doth produce a rubie Colour, and emetick Virtue: In this preparation if that the Nitre be mingled in a greater proportion, the Antimony will be too much calcined, and the remaining Mass after its burning, being imbued with less Sulphur, becomes no more red, but yellow or citron Colour, and less Vomitive.

The account of the reason of it.

4. Sulphur of Antimony.

Take of the Salt of Tartar or of Wormwood ℥viiij , let it be melted in a Crucible set into a Wind Furnace, then cast in one Spoonful after another ℥vj of crude Antimony pulverised, let it flow for a quarter of an Hour, then pour it forth into a silver or brazen Vessel, and let the Mass of a saffron or yellow Colour be edulcorated by often washing it. The Dose is from *gr. v* to *x*: it works much gentler and kindlier than any other preparation besides.

The preparation of the Sulphur of Antimony.

In this preparation the fixed Salt being made to flow by the Fire unlocks the Body of the Antimony which is chiefly composed of Sulphur, and an acid Salt, for whilst that the Salts are so combined, the sulphureous Particles are the more loosened, and the saline Bitings become less sharp; wherefore though it may be highly red, yet it doth not greatly or violently irritate the Stomach: further by reason that the Sulphur is more loosened and the Salt more at liberty, its Powder easily communicates its Tincture to the Spirit of Wine; which, when that it hath quite forsaken the saline Particles, it loses its emetick force, and becomes a notable Comfortative.

The reason of it.

That indeed Antimony, and common Sulphur, and perhaps many others of the same nature, consist of an acid Salt and Sulphur combined together, may be made evident by very many experiments: for besides that the Concretes of the same kind are easily unlocked by fixed Salt, further if at any time they are dissolved by a sulphureous *Menstruum*, as Oyl of Turpentine, Juniper or Linseed, their Sulphureous Particles being imbibed by the Solvent, the remaining saline Particles (which distilled, run into an acid Liquor) do easily grow into Crystals: This is most evidently plain in the preparation of the Balsam of Sulphur. But if an acid *Stagma*, to wit, *Aqua Fortis* or *Aqua Regia*, be poured upon pulverised Antimony, and distilled with a strong fire, a citron coloured Sulphur hardly to be discerned from the common Sulphur will be sublimed in great quantity; it being certainly an assured mark that the common Sulphur consists chiefly of sulphureous little Bodies compacted with an acid Salt. Out of the Sulphur of Antimony prepared as it is above described, I make a Liquor of an oily form,

The Synthesis of Antimony and common Sulphur.

Their Analysis.

which

Part I.

which very pure Sulphur of Antimony will guild Silver at the first firing over, and is of excellent use in Medicine.

Mercurius Vita.

Take of Choice Antimony and Mercurie sublimate alike ʒvj let them be pounded together, and being well mixt distilled in a glass Retort in Sand, a gummie Liquor will ascend like Ice exceeding corrosive, which adhering to the Neck of the Retort melts if you apply Fire to it, and falls down into the receiver. This being cleansed by rectification or by flinging therein spring Water it will be precipitated into a most white Powder, the Water in the mean time getting a sharp taste like the Spirit of Vitriol. This Powder beingedulcorated and dried is, commonly called the Mercury of Life and *Mercurius Vita*, but not truly, when as it contains nothing at all of Mercurie in it, and unless it be cautiously given, it is oftner the Author of Death than of Life. Its Dose is from *gr. iij* to *vj*.

The reason of
this preparation.

In this operation the Spirits of the acid Vitriol and Nitre, being combined first of all with the Mercury in the Subliming, when they are loosned by the Fire, deserting that first guest, they more lovingly embrace the little Bodies of the Antimony, and when being elevated by the force of the Fire, they grow together into an icy-form substance, which consists of the whole Sulphur of the Antimony with a little of its Salt, and also of the sharp *stigma* of the Nitre and Vitriol, by reason of the saline Particles it grows stiff like Ice, and because of the sulphureous Particles it is melted by the Fire. This matter, Water being poured thereon, is precipitated into a white Powder, which consists meerly of antimonial Bodies, like to the Flowers of Antimony; in the mean time the sharp Salts being loosned in the *Menstruum*, they make it sharp like the Spirits of Vitriol. But that notwithstanding, this Powder hath nothing of Mercury in it, it is clear, because this being deprived of its congelative Salts, it resumes its ancient species of Quicksilver, and the whole is collected in the retort. And truly those Salts are easily taken away from Mercury, and of their own accord desert it, as often as they find another Body more friendly: hence if that you boyl sublimate with iron Plates in ordinary Water, by and by the Salts embracing the Iron, the Mercury revives. This too cruelly vomitive Powder if it be infused with calcined Sea Salt, and sweetned by often washings, becomes much gentler, and safe enough, for that the sharp pricking Salts of the Medicine are consumed, or overcome by the Salts of another disposition. Further if it be put to fusion with Nitre in a Crucible, the sulphureous Particles being wholly taken away, it forthwith looses its emetick Force, and even becomes pure Diaphoretick Antimony.

The correction of
this Medicine.

How antimonial
Vomitaries
operate in our
Bodies.

So much concerning antimonial Vomitories whose Particles being dissolved in the Stomach give it a sulphureous-saline Tincture, which its Fibres Imbibing, are so notably hauled that a Convulsion being there excited on every side through its whole Cavity, as also reaching to its near adjoining *Viscera*, to wit, the *Duodenum*, the Choler-bringing Pore, the Passage of the *Pancreas*, it causes what is contained in them all to be squeezed forth, and to be emptied into the Ventricle, yea the serous Humours to be drawn from the little Mouths of the Arteries, so that cruel Vomitings and Vexations follow for a long time after. It is also probable that some of its emetick Tincture is likewise received into the Veins, which by means of the running together of the Salts is delated thorow the whole sanguineous Mass, and induces struglings and combinations, Precipitations and Excretions of a certain matter: wherefore the Diseases of parts at a great distance, to wit, cutaneous Diseases, Leprosies, and Gouts, are sometimes cured by antimonial Medicines.

How Mercuri-
als.

But yet Mercurial Medicines (of which we shall speak next) do effect this much more powerfully; for that they stir up not only Velications and vomitive Excretions in the Stomach, but moreover by their more active Particles communicated to the Blood, they cause its divers manners of Fluxions, and also dissipations, precipitations, and separations of the Serous and of other Humours; by which means besides Vomiting and Purging, evacuation by Urine, by Sweat, and sometimes Salivation

tion is procured, wherefore in inveterate and contumacious Diseases they run to the use of these as to the last refuge.

Mercury or Quicksilver if it be taken simple and by it self, like Antimony, works neither by Vomit nor by Stool; and stirs up almost no perturbation in mans body. But if by a dissolving mixture, its active Particles being set at liberty, it be reduced to powder; it becomes an highly purging Medicine. Though there be very many ways of fixing this versatile and fugitive *Protens*, and of preparing it for medicinal use, these two chiefly are insisted on, that is to say; it is either sublimated or reduced into a precipitate. Its preparations of the first kind do not properly belong to the Class of Emeticks, but for the latter almost every one of them ought to be referred hither. But as to our purpose it will be sufficient briefly to touch upon here a few of them and which are of chiefest Note. Therefore first of all we shall inform you, that Mercury is either precipitated by it self, or with Metals alone, or with Salts alone, or with Metals and Salts together.

Part I.

Mercury or Quicksilver is no Cathartic of it self.

By what means it is made operative.

1. Mercury precipitate by it self.

Mercury precipitated by it self.

Take of the best purified Mercury $\mathfrak{z}\text{ij}$, let it be put into a Glass fit for this use (which is coming something near to the form of an Hour-glass, with a double bottom like a Top, let it be broad and plain at either end, and strait in the middle, having a Beak with a very small Orifice reaching from the bottom of the one into the belly of the other) which Vessel being equally placed in a sand Furnace; put thereto fire at first gently, afterwards more strongly until part of the Mercury be elevated in a greyish Powder, and the other stick like Quicksilver in the upper bottom: Then turning the Vessel let the upper part be put into the Sand, and so turn the Glass so often till all the Mercury goes into Powder, which breaking the Glass, is to be collected, and to be washed with sweet water: The Dose is *gr.* iiij to 5 or 6. it for the most part moves to vomiting, and doth not work by salivation.

The reason of the Process seems to be this, that the *Effluvia* of a constant Fire do first of all loosen the Concretion of the Mercury, and dissolve by little and little its particles, and then draw them one from another, so that they fall away one from the other; and as it were, broken into bits, may remain distinct. Hence those most active little Bodies, being of their own nature Saline and Sulphureous, stir up mighty perturbations in the Humane Body, by pulling the Fibres, and by heating them with their Salts: But yet this Precipitate works less upon the Salts inhabiting the Blood, than Mercury precipitate with Salts, because a Salivation is easily excited by this, never by that. Even as Mercury, so certain other Mineral Bodies, as Lead, Tin, Antimony, Iron, are wont by the force of a constant Fire to be Calcined to Powder or *Crocus*.

The shewing of the Reason of the process.

2. Mercury precipitate Solar.

Mercury precipitated with Metals of the Sun.

Take of Gold purg'd with Antimony, and exactly purified, $\mathfrak{z}\text{j}$. of the very best depurated Quicksilver or drawn forth of Cinnabar and Sublimate $\mathfrak{z}\text{viiij}$. make an *amalgama* in a Crucible, by casting in the Gold, being made hot, to the Mercury while it is melting: This being well washed with Salt and Vinegar, and wrung thorow a Cloth into such a Glass, prepared like that for the Mercury precipitated by it self; let it be digested in sand, until it be reduced into a red Powder: Then let it be edulcorated with Cordial waters. The Dose is from *gr.* iiij to vj . it operates only by Vomit for the most part, and moves not as the saline precipitate, to Salivation. After the same manner may the Lunary, and Jovial precipitates be prepared.

The reason of this Process is as the former, to wit, the little Atoms of Fire, as so many little Pestles beat the Mineral Body into small parcels, and break them so for the time, that they cannot easily cohere and grow together again. Further, this *Amalgama* by reason of the Bodies of the Mercury and the Gold being first opened by themselves, doth much easier become precipitated, than the Mercury by it self.

The reason of the preparation.

Part 1.

3. The Common Mercury precipitate.

Mercury precipitate with Corrosive Liquors.

1. With Aqua fortis.

The reason of the preparation.

Its precipitation with Oyl of Sulphur or Spirit of Vitriol.

How Mercurial Medicines operate in the Ventricle.

Take of the best purged Mercury ℥ij . of *Aqua fortis* ℥iiij . make a solution, which being put into an Earthen Vessel glaz'd, let it evaporate first with a gentle heat to consume its moisture, then by increasing the fire till the Vessel glow again, let it be calcined, stirring it about with an Iron Rod till it acquires a red Colour. The matter being taken forth and powder'd, first by often washings with sweet water; then the burning it being reiterated, let it beedulcorated by the affusion of spirits of Wine, and so kept for use. The Dose is gr. iij to v or vj . it operates violently enough by Vomit, and provokes by Salivation more certainly than any other preparation of Mercury whatsoever.

If the reason of this Chymical Preparation be enquired into, we say that the Mercury is dissolved by the *Aqua fortis*, for as much as the saline Particles of the *Menstruum* running to meet the Salts of the metal, they presently snatch them to themselves, and then the bond of the mixture being loosened; all the other Particles are set at liberty, and hide themselves on every side within the pores of the *Menstruum*: Then after that the Humidity is taken away, the saline Particles being left and brought into view, they forthwith strike upon the included Mercurial Particles and are mixed together every where. But as Mercury precipitated after this manner with *Aqua fortis* or *Aqua regis* grows red, otherwise than it doth prepared with Oyl of Sulphur or Spirit of Vitriol; the reason is partly from the Nitre always causing a flamy colour which enters into that *Menstruum* and not into these, and partly from the Mercury it self, whose loosened Particles, whilst at liberty and not hidden by others, of their own nature are red, as may be perceived in Mercury precipitated by it self, and in its solution, which, to wit the Mercury, loses its red powder, being infused in the Oyl of Tartar.

This Medicine consisting very much of Corrosive Salts, and also of equal loosened Mercurial Particles, for as much as it highly irritates the Fibres of the Ventricle, stirs up most violent Vomiting, so that for this purpose 'tis seldom given alone.

But if when it is taken, and that at last having gone into the Ventricle and passed the first passages; it be carried into the mass of the blood, for as much as its implanted Salts are thereby very much fermented, and that the Mercurial Particles being plentifully infused, and intimately mixed with them are so intangled; that they cannot by any way more commodious be thrust forth again (as we shew in another place) than by the salival passages, for that reason this Medicine moves spitting more than many others.

4. The Turbith Minerale.

Mineral Turbith.

Take of purified Quicksilver, Oyl of Vitriol (or of Sulphur *per Campanam*) dephlegmed, alike equal parts, being put in to a Glass retort; let them be distill'd, the Fire being increased by degrees until all the humidity be drawn away, there remaining in the bottom a white Mass: Which, spring water being poured thereon presently becomes yellow, this by often washing and firing of the Spirit of wine beingedulcorated and dried, may be given from gr. iij to vj or vij . It works by Vomit somewhat gentler than Common precipitate, and sometimes also it procures salivation.

The reason of the preparation.

The process of this as to the precipitation of the Mercury, hath the same reason as the former, but the remaining Calx does not grow red as the former; partly for the absence of the Nitre, and partly because the Mercury being less subdued does not suffer so intense a Calcination; that the Salts being in a great part blown away, it should shew its own proper Colour, to wit, a Crimson Colour: But if for that end it should be urged with a violent fire; it will fly quite away: Therefore the white Colour proceeds from the Salts which stick to the Particles of the Mercury, which being afterwards something washed away, the yellowness succeeds.

Further in as much as the Mercurial Particles are not so strictly combined with the Salts, and therefore are not by them introduced in so great plenty into the sanguineous mass, a salivation is not so promptly and surely excited by this Medicine.

This

This Medicine may be prepared after this manner more compendiously, and not less effectual.

Take purified Quicksilver, Oyl of Vitriol or of Sulphur alike $\mathfrak{z}\text{ij}$, being put into a Crucible first let all the humidity with a gentle fire evaporate away, then let it be urged with a stronger, that the calcined matter may be better fixed.

Part I.

5. Aurum Vitæ.

§. Gold of Life.

Take of purified Mercury $\mathfrak{z}\text{v}$; of excellently purified Gold $\mathfrak{z}\mathfrak{ss}$: Let each of them be dissolved in their proper *Menstruums*, and the solutions put together, and all its humidity be done away by distillation in a Retort; let the remaining *Calx* be Calcined upon red hot Steel Plates, that the Salts may in a great part be done away, let the remaining matter be sweetned by washing with fair water, and Ascension of the Spirit of Wine.

6. The Hercules of Bovius.

The Hercules of Bovius.

This Medicine will be better prepared, if both the Metallick Bodies be dissolved in the same *Menstruum*, which by the Prescription of *Thomas Bovius* may be effected after this manner.

Take of calcined Vitriol, and of Nitre alike one pound, let them be distill'd in a reverberating Furnace, the Liquor being distill'd pour into the Glass Retort one pound of Sea Salt calcined, and draw it off by a gentle heat in sand, for it will very easily ascend; one part of this dissolves Mercury and the other Gold; then let both the solutions be drawn off together, and by frequent Cohobations adding every time about the third part of the same *Menstruum*, let the distillation be repeated until the matter be enough fixed, which being sweetned after the aforesaid manner keep it for use. The Dose is from *gr. iij* to *vj* or *vij*. (or)

Take of purged Mercury $\mathfrak{z}\text{iiij}$, of cleansed Gold $\mathfrak{z}\text{ss}$. make an *Amalgama* as is above shewed, to which being washed and put into a Retort, pour the aforesaid *Menstruum* of *Bovius*, let it be drawn off in a Sand Furnace, and with often Cohobations adding every time a third part of the same *Menstruum*; let the distillation be repeated until the matter be enough fixed, which calcine upon red hot Plates of Iron, and let it be sweetned by frequent washings and ascension of the Spirit of Wine. The Dose *gr. iij* to *vj*. It operates by Vomit not very violently, and for as much as it operates beyond the *Viscera* into the mass of Blood, it oftentimes gives help in very great Diseases.

As to what belongs to the *Ætiology* of this Chymical process, we say, whilst these two Champions striving together do mutually lay hold of and bruise one another, a third (and sometimes a fourth) coming upon them; binds them: Whereby they are more strictly complicated, and broken more minutely. But truly both the Gold by the Mercury, and both of them by the *Menstruums*, are dissolved and torn into little bits: then the Humidity being abstracted, the saline Particles of the Metals are combined with the Salts of the *Menstruum*. In the mean time the remaining metallick little bodies being cast between and shut up within the pores of the Salts. But yet this Combination is not so strict, but that the Metals by themselves or either of them by Solution and Coagulation with its proper *Menstruum*, may be reduced into precipitate: For indeed since that both the metallick Particles and the saline *Menstruums* in that prepared Precipitate, are so many and so diverse, all of them cannot be absolutely united. Wherefore that matter (as I have often observed) is not but very hardly fixed, and to be reduced into a *Calx* proper for Medicine; for if for the drawing off the *Menstruum*, too strong a heat be applied; the Mercury will ascend, and the remaining Gold resume its proper Species: But if the Fire be more remiss than it ought, the Combination of the Salts with the metallick Particles will not be strict enough, but that it will be taken away with mere ablution; so that common Water being poured on the Precipitate, it shall wholly dissolve it, and drink up the whole matter into it self, and then the whole Work must be well nigh reiterated for to make the Medicine.

Part I.

The Reason of the
Hercules of Bo-
vius.

The Reason of the
Epicene Men-
struum of Bo-
vius.

The ground of this Medicine is Mercury, by whose means it is expected, that its Particles should ferment all the Juices of mans body, and remove the separations of every heterogeneous heap both in the *Viscera* and in the Vessels. The Gold seems to be added for the taming the Mercury, and for breaking its too fierce and untamable Particles. Further, the Salts of the *Menstruum* break either of the bodies into small bits, and carry them more readily into the bloody Mass, and into these more inward recesses.

In the distillation of this *Menstruum* of both kinds described by *Bovius*, (by which both Metals are dissolved) there happens notable encounters and decertations of the Salts as it were for Life and Death: For when the *Aqua fortis* is poured upon the prepared Sea Salt, it possesses its Earth and takes possession, as it were, of its own soil, driving away from thence the Spirit of the Salt as it were set at liberty. This more clearly appears, if at any time the Spirit of Vitriol, being poured upon the Calcined Sea Salt, it be distilled, for that by a very small heat of the Sand Bath; even the very pure Spirit of the Salt ascends as an Exile, the Vitriolick *Stagma* invading its habitation. In truth these Salts are too little of kin, that they should be combined together: Wherefore being put into too streit a habitation; when they can neither be united nor cohabit; the stronger usurping the Dominion expells the weaker out of doors.

CHAP. III.

Of the Remedy of too much Vomiting, also of Antie-
metick Medicines, or such as stop Vomiting.

Nature being incited to a violent motion, oftentimes goes beyond its bounds, and runs forth beyond measure, so that there is sometimes need of a stop or *remora*, whereby its violence might be stayed. This is plainly discerned in vomiting, if at any time it be immoderate, through the operation of a medicine, or for any other occasions; it therefore belongs as much to Medicine to allay this fury of the Stomach as to stir it up. How many ways, and for what causes Vomiting is wont to happen without taking an Emetick, we have already declared: Besides it is obvious to common observation, that this evacuation provoked by Medicine is sometimes so violent and so long, that unless it be stopped by the help of Art, Life it self will be in manifest danger. Therefore as in the practice of Physick Emetick medicines are of necessary use; so sometimes for the stopping that Excretion (as often as it shall be too much or preternatural) Remedies contrary to the former, or Antidotes for Vomiting are made known. We will therefore in the first place, shew how excessive Vomitings caused by an Emetick are cured: And then Secondly, by what means and remedies preternatural Vomiting, raised by reason of other Causes, may be helped.

Immoderate Vo-
miting proceeds
either from an
Emetick Medi-
cine or from o-
ther Causes.

As to the first, Vomiting raised by a medicine becomes more vehement and continues longer, because the animal Spirits being irritated beyond measure and growing angry; their disorders are not easily or presently remitted, but that they thrusting forth themselves do by frequent fits stir up violent Emetick Convulsions, and often repeat them. Moreover that explosive Force begun in the Ventricle, is not seldom propagated to the Spirits inhabiting the neighbouring parts, and from thence to others, and at last sometimes to their whole *Systasis*, in so much that Torments and Convulsions in the *Viscera*, afterwards in the Midriff, and lastly in the whole Body with manifest danger of Life follow Vomiting.

The Reasons of
the former are
unfolded.

The Spirits are above measure irritated, either from the Medicine only by reason of the disproportion of quality or quantity to them; or else from the other humours, as the like sharp serum, and others being poured into the Ventricle in the time of Vomiting. Besides in some the animal Spirits are so tender and Elastick, that

Part I.

that from every Emetick irritation though very light, both those inhabiting the Ventricle, and those also which are near about are excited into Convulsive Expulsions. Hence many enquiring from the Vomitory about the Milt, Paunch, and other inwards, impute the whole business to the Vapours stirred up by the Medicine, when indeed it happens altogether by reason of the Animal Spirits being readily too much moved, and hardly to be appeased.

If this overworking be caused by the Medicine, let the Patient, being presently put to Bed, make use of both external and internal remedies: And first of all that the Lodgers in the Ventricle may be quieted; let there be administered either a fomentation warm, of the Decoction of Pontick Wormwood, Mint, and Spices in red Wine, or a Cake of a piece of bread toasted, and dipped in Claret Wine warmed, applied thereto. Let there be a Glisten given of Milk with Treacle dissolved therein: Let also warm Frictions of the members be used, and strong Ligatures above the Knees which may drive away the Convulsions from those parts. Let the Ventricle in the mean time be kept empty, unless swooning follows: But as soon as he may be able to take any thing of food or medicine, let him have some Cordial water or warm burnt wine. In very great perturbation, if the Pulse admit it, Treacle Andromick, or *Diascordium*, also sometimes a solution of *Laudanum* or Opiatick Tinctures are convenient.

In preternatural Vomiting stirred up from other Causes, we must consider whether it be Critick or Judicial, or Symptomatick Signal. In the former there is nothing to be done suddenly or rashly: that superfluity whilst they have strength, may not be stop'd, but the going forth of the matter to be expelled is either to be facilitated or hastned, or to be carried forth by some other way. Hence being urged by a nausea and striving to vomit, it is convenient to give Posset-drink simple or with the leaves of *Carduus* boyled therein, also sometimes *Oxymel*, and wine of Squills or Antimonial Wine. Sometimes Glysters are used, and sometimes also a gentle purge carries away the matter, boyling in the Stomach by a more easie way of exclusion through the Intestines.

(2.) In Symptomatick Vomiting a conjunct cause (as we have already intimated) either subsisting in the Ventricle, produces that Idiopathick or proper Affection; or fixed in other parts stirs up their Convulsions, and a Communication being made by the Nerves, the Emetick perturbations in the Ventricle, as in the Nephritick Paroxysms, Colicks, Hystrick passions, Vertigo and many others use to happen, the healing of which sort of Sympathick Vomiting, depends upon the cure of the primary Disease.

When the Stomach is primarily affected, the Cause is, that the Nervous Fibres irritated above measure, provoke the other mottricious Fibres into excretory Convulsions. But these are irritated from an improporportionate Object, viz. In as much as they are not able to thrust forth to the Intestines or to overcome, or to digest rightly a certain matter which lies upon them, but are necessitated by exciting Vomiting to cast it the soonest way out of doors. That Matter beomes so incongruous or untamable by its own proper viciousness, for as much as offending in quality or quantity it provokes the Nervous Fibres; or by the fault of the Stomach it self, because that its tone is lax, and its Fibres becomes so weak, that they cannot be able to overcome or tolerate the Chyle it self, much less the excrementitious humours, but that being impatient of its burthen, they cast forth whatsoever is contained within by Vomiting. As there are various causes of either of these, and manners of affecting, we will here shew some of the chief of them, together with the Remedies and the reasons of the Cure.

The Emetick matter subsisting in the Ventricle is either poured into it from another place, or is begot there by reason of its depravity or want of Concoction: in either respect the present Ballast is first of all to be carried forth, then its more fruitful increase must be cut away, or provided against.

Therefore that the filthy *Colluvies* of the viscous matter may be cleansed out of the Ventricle, let there be prescrib'd a gentle Vomit, of *Carduus* Posset-drink, or of *Oxymel* or Wine of Squills or of the decoction of the Flowers of Camomil, or of the Roots of Agrimony with the solution of the Salt of Vitriol or such like, then the Reliques may be gently carried off by Glysters or Catarticks either by the Pills of Maltich: Stomach Pills with Gumms, or sacred Tincture or with the Infusion of Rhubarb. Moreover when the impure rank Blood

Its Cure.

Vomiting from other Causes is either Critick or Symptomatick.

The latter is either Idiopathick or Sympathick.

When the Stomach is primarily affected what method to be used.

heaping

Part. I.

heaping up anon a new provision of incongruous Matter oftentimes flowing into the Ventricle either through the Arteries, or the Choler-carrying Vessels, brings in an emetick Disposition. Blood letting doth not rarely give help, and therefore the Vomiting of great bellied Women are frequently cured by this kind of Remedy. Besides those things are convenient which may attemper the Blood, whereby the less adust Excrements may be therein generated. Hence it is that Whey, the drinking of medicinal Waters, the Juice of Herbs, *Sal Prunella* and such like for as much as they scatter the Blood, and carry its Excrements to another place, they often take away the Vomitive Disposition. These kinds of remedies are likewise used if that frequent and daily Vomiting, proceeds (according to the opinion of some) from the meeting and wrestling of the biliary and pancreatick Humours, and their regurgitation into the Ventricle.

The frequent Vomiting and the hardest to be cured is that which proceeds from an incongruous Matter begot within the Ventricle, and from thence becomes Emetick, for as much certainly as by reason of the vitiated Ferment of this *Viscus*, whatsoever is eaten, degenerates into an irritative putrefaction. Wherefore in this case, after that the filth of the Stomach is cleansed by a gentle Evacuation, they are wont to make use of remedies commonly called Digestive, which, even as the fermental Juice of the Ventricle, being very much of a saltish disposition and sometimes also of a sulphureous, shall be in a various state of Fixation, flowing or adustion, consist after a divers manner, and are rather helpful now this way now that way.

In Belching, and acid Vomiting, these following Medicines may be tryed, and the Rule of the Method to be relyed upon may be chosen out of the things that bring help.

The Vomiting
proceeding from
the Ventricles
being Vitiated
how to be cured.

Remedies a-
gainst the too
much acideness
of its Ferment.

Take of the Powder of *Ari Compos.* $\mathfrak{z}\text{ij}$, of the Salt of Wormwood $\mathfrak{z}\text{ij}$, of the Sugar of Roses $\mathfrak{z}\text{ij}$, make a Powder, give of it in the Morning and at five a clock in the afternoon, $\mathfrak{z}\text{j}$ in a little draught of Ale boyled with Mace and a Crust of Bread or in distilled Water or Tincture of Roman Wormwood.

Take of the Powder of Ivory, the Eyes of Crabs, of red Coral alike of each $\mathfrak{z}\text{ij}$, of calcined Coral $\mathfrak{z}\text{j}$, of red Sanders, Cinnamon *ana* $\mathfrak{z}\beta$ make a Powder, Dose $\mathfrak{z}\beta$ after the same manner.

Take of *Lignum Aloes* of yellow Sanders, of the Bark of Mint, of each $\mathfrak{z}\text{ij}$, of white Chalk $\mathfrak{z}\text{vj}$, Sugarcandy $\mathfrak{z}\beta$, of the solution of Tragacant, of the Water of Mints, make a Palt, and let them be formed into Troches of $\mathfrak{z}\beta$ weight; let him eat ij or iiij thrice or oftner in a Day.

2. Against its
Ferment being
too sour.

Take of the Tincture of the Salt of Tartar $\mathfrak{z}\text{j}$, the Dose is $\mathfrak{z}\text{j}$ to $\mathfrak{z}\beta$, twice a Day in some proper distilled Water.

2. In sour Vomiting, Medicines endued with a warm, sharp, vitriolick Salt are more convenient,

That famous one of *Riverius* in this case is the chief.

Take of the Salt of Wormwood $\mathfrak{z}\text{j}$ given in a spoonful of the Juice of Limons.

Take of prepared Coral $\mathfrak{z}\text{ij}$, of the Salt of Wormwood $\mathfrak{z}\text{ij}$, of the Juice of Limons $\mathfrak{z}\text{iiij}$ let them stand in a larg Glas, add to them of the strong Water of Cinnamon $\mathfrak{z}\text{ij}$. The Dose is a Spoonful or two twice a Day, the Glas being first shaken.

Take of Ivory, Coral, of each $\mathfrak{z}\text{ij}$ powder, of the Vitriol of Steel $\mathfrak{z}\text{j}$, of Sugar-candie $\mathfrak{z}\text{j}$ mingle them, and divide them into 6 or 8 Parts, of which take one part twice in a Day in some convenient Vehicle.

In this case purging mineral Waters which have much Nitre in them, also your Iron tinged Waters and indeed our artificial Chalybeates are wont to give notable help.

3. Against the
Stomach being
too bitter.

If at any time the Stomach perverting the most part of what is put into it to a bilious and bitter Rottenness (as it often is wont) and for that reason is prone to frequent Vomiting, then both sharp, and also bitter remedies are convenient.

Take of *Elixir Proprietatis* $\mathfrak{z}\text{j}$, the Dose $\mathfrak{z}\text{j}$ twice in a day in some fit Vehicle.

Take of Rhubarb Powder *gr.* xxv, of the Salt of Wormwood $\mathfrak{z}\text{j}$, of the Water of Cinnamon $\mathfrak{z}\beta$, of the Juice of Lemons $\mathfrak{z}\text{j}$, mingle them, take of it by it self or mixt with some other Liquor.

Take

Take Powder of *Ari Compos.* $\mathfrak{z}\mathfrak{i}\mathfrak{\beta}$, of Tartar Crystallized $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, of the Vitriol of Steel $\mathfrak{z}\mathfrak{j}$, of Sugar $\mathfrak{z}\mathfrak{\beta}$, make a powder; the dose is $\mathfrak{z}\mathfrak{\beta}$, or $\mathfrak{z}\mathfrak{i}\mathfrak{j}$ every Morning drinking after it a draught of the tincture of Pontic Wormwood or Coffee. Part I.

Take of the Powder of Crabbs Eyes $\mathfrak{z}\mathfrak{\beta}$, of the Chalybeate Tartar $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, of Sugar-Candie $\mathfrak{z}\mathfrak{j}$, make a Powder; the Dose $\mathfrak{z}\mathfrak{\beta}$ in a fit Vehicle twice in a day.

Oftentimes the cause of a frequent and habitual Vomiting is not so much the matter irritating the Ventricle, as the debility of its nervous Fibres, and their too great propensity to irritation; for that they are so tender or infirm that they are not able neither to Concoct what is taken in, nor to suffer the weight or burthen of them, but that they are presently irritated by any thing lying upon them, and therefore to expel what is so troublesome, they provoke the fleshy Fibres into Emetick Convulsions. *Vomiting from the debility of the Ventricle.*

There are two principal Causes of this kind of Affection; viz. either the debility of the Stomach is in the Fibers themselves contracted by inordinate passions, as surfeiting too often, and immoderate drinking by too frequent taking of Wine or strong Waters, and by other inordinacies of eating and drinking, so that these Fibres, for as much as they are beyond measure distended, or made too hot and as it were roasted, are not able to admit or contain the animal Spirits in enough plentiful abundance: Or secondly these Fibres although they may be well enough of themselves, yet for that the Nerves are in some other place obstructed, they are destitute of the due afflux of Spirits, and from thence being languid and flaccid, they are not able to bear what is taken in, but presently being aggravated, they endeavour to cast it forth by Vomiting: so I have known many without any impurity of the Ventricle, or *Langnor* contracted through irregularities, affected with a certain kind of palse of that *Viscus*, to have wanted appetite, and to have been obnoxious to assiduous Vomiting. *Of which there are two causes.*

In the former Disease those kind of remedies are prescribed, which may cause the too much distended and tenuated Fibres to wrinkle themselves and to be contracted into a shorter Space; also such as may allure thither more copiously the Spirits by their grateful usage, and cherish the Languid. *Or the love of the Fibres is decay'd.*

Take of the Elixir of Vitriol of *Mynsichtus* $\mathfrak{z}\mathfrak{j}$; the Dose is from 10 drops to 15 twice or thrice in a Day in a spoonful of distilled Water, drinking 7 or 8 spoonfuls of the same after it. *2. Or there is a defect of Spirits by reason the Nerves are obstructed.*

Take the tops of Cypress $\mathfrak{v}\mathfrak{j}$ handfuls, of the Leaves of Clary $\mathfrak{i}\mathfrak{i}\mathfrak{j}$ handfuls of exterior Barks of Orange 12, Cinamon, Mace of each $\mathfrak{z}\mathfrak{j}$, of the Roots of Galingal the less, and of Cypress of each $\mathfrak{z}\mathfrak{\beta}$; being sliced and bruised let them be put into viij lb of *Brunswick* Beer and distilled in an ordinary Still. *The cure of the former affection.*

Take of the Tincture of Tolutan Balsom with the Tincture of the Salt of Tartar extracted $\mathfrak{z}\mathfrak{j}$, Dose 20 gr. with the same Vehicle, the Tincture of Wormwood prepared with the same *Menstruum* may be tried.

Take of the Powder of the Flowers of Wormwood, of Mirtle dried in the hot Sun, of each $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, Cinamon, Flowers of red Roses of each $\mathfrak{z}\mathfrak{j}$, Cubebs, Roots of Galingal the less of each $\mathfrak{z}\mathfrak{\beta}$, of red Coral broken $\mathfrak{z}\mathfrak{j}$, make of them all a subtle Powder, then with $\mathfrak{z}\mathfrak{v}\mathfrak{j}$ of the whitest Sugar dissolved in Cinamon Water and boyled up to a Consistency make of them all Tablets each weighing $\mathfrak{z}\mathfrak{\beta}$, eat one or two as often in a Day as you please.

Take of the Conserve of red Roses vitriolated $\mathfrak{z}\mathfrak{i}\mathfrak{i}\mathfrak{j}$ candied Myrabolans $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, Ginger candied in the Indies $\mathfrak{z}\mathfrak{\beta}$, *Species* of Hyacynth $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, of the reddest *Crocus* of Steel $\mathfrak{z}\mathfrak{j}$, Syrrup of Coral what will suffice, make thereof an Electuary the Dose $\mathfrak{z}\mathfrak{j}$, twice in a Day drinking after it a little draught of distilled Water.

2. In the debility or resolution of the Ventricle by reason of the Nerves being somewhere obstructed, Antiparalytick Remedies joyned with Stomachals are of chiefest use. *How the Palse of the Ventricle is to be cured.*

Take of the *Elix. Proprietatis Tart.* $\mathfrak{z}\mathfrak{j}$, the Dose $\mathfrak{z}\mathfrak{j}$, twice in a Day with

Part I.

with the Water above prescribed, The Tincture of the Salt of Tartar, of Coral, of Antimony, may be made use of after the same manner. In this case also the sweet Spirits of Salt, the Spirit of *Sal Armoniac* or its Flowers do give notable help. Besides Vomitories and Purges, and even Diaphoreticks are oftentimes successfully administred. I have known this Disease sometimes happily cured by bathing in our Baths of *Bathe*.

SECT. III.

SECT. III.

CHAP. I.

Of Purging and of purging Medicines.

Purging seems to be an Affection contrary to Vomiting, or rather inverted; for truly in this and in that, they run from the Prisons of the same Ventricle, to a divers Goal. For even as in Vomiting the interior fleshy Fibres of the Stomach being inflated by the sudden running in of the Spirits into their left Ends, and so being contracted they make its bottom and sides to be drawn together, and to be brought upwards towards the left Orifice, to the end that its Contents may be carried forth above: so in purging, the same fleshy Fibres being in like manner inflated at their right ends, and contracted, they cause the whole circumference of the Stomach to be gathered together, and to be inclined towards the *Pylorus*, that the Excrement may pass away by the inferior Parts. As the excretory Motion begun from the Ventricle is continued by the *Oesophagus*, so it is in purging by the Intestines, and either of them is propagated by the fleshy Fibres from part to part to the end. In either affection the motion of the Stomach is violent, and after a manner convulsive, so that sometimes either is changed into the other. For purging being too much hastned from a sharp Provocative, oftentimes causes Vomiting: in like manner purging of the Belly follows from an emetick Medicine: the reason of which is, because the animal Spirits being vehemently irritated, and thrust forth, they leap diversely sometimes into these and sometimes into those ends of the fleshy Fibres; almost after the same manner as if you should too much urge a generous Horse with your Spurs, you will force him sometimes to run forward, and sometimes to leap backward.

Purging is an affection contrary or inverse to Vomiting.

Therefore Purging is an excretory Motion in the Ventricle, and in the Intestines, by reason of their fleshy Fibres being swiftly and orderly contracted quicker and faster whereby the Chyle and its *Feces*, both the recrements of the Humours, or the Corruptions there begotten, or pour'd in from another Part, may be thrust on from one part unto another until they be cast forth a doors at the Fundament as thorow a Sink. For the Ventricle being irritated by the prickings of the Cathartick, contracting it self quicker and more straitly towards the *Pylorus*, pours forth whatsoever it cherishes in its Bosom, into the *Duodenum*; and the Intestines being pulled together, they reiterate greater and more frequent excretory Spasms, by which most of the Contents before heaped up in their Cavities, or attracted, or expressed at that time, are excluded. Also Purging is that sort of violent and constrained Excretion, which Nature being quiet performs at leisure and at times; in such Nature being provoked, acts not without tumult and a certain perturbation. Therefore for the more perfect knowledge of Purgation it seems requisite, that first of all we should shew what are the Contents of the Ventricle and the Intestines, both their proper, and those suggested from another place, which are wont to be sent forth by Stool. Then these being effected, it will be reason to explicate by what means, and by what strife purging Medicines do perform their Operations.

Its Description.

1. As to the first, the chief Contents of the Ventricle and Intestines are the Chylous Mass, and its remaining *Feces* after the distribution of the nutritious Juice, the filth of these inwards smeering the hairy Crust, and Water sticking

The Contents of the Ventricle and the Intestines which purging Medicines carry forth.

Part I.

The chylous mass, the remaining faeces, muck, water, and serum abounding in the Glandulae and Arteries.

2. Wind.

How winds are begotten within the Cavities of the Bowels.

Blasts are sometimes the Cause and sometimes effects of the Extensions in the Viscera.

After what manner the winds in Cramps are wont to be begotten.

in its Glandulae; with which go a ferous water flowing from the mouths of the Arteries, as also the Recrements of the blood and humours, which by the Choler carrying Vessels, the Pipe of the *Pancreas*, the mouths of the Arteries, and also by the extremities of the nervous Fibres, and by other ways perhaps, are poured into their interior Cavities. For thorow the intestinal Pipes, as it were through a sink, the whole impurity of the Body is wont not seldom to be purged forth; which indeed if reſtagnating within, they either puff up through their plenty, or being imbued with sharpneſs, by making ſlippery, or by ſtimulating the Belly they provoke to very frequent and plentiful Stools.

Befides theſe kind of Contents there is yet another reſulting from theſe, viz. Winds, which are wont to be ſtirred up within the Stomach, and the Cavities of the Inteſtines more than in any other part of the whole Body, and ſeem to be produced after this manner: Whiſt that the Aliments being conſtrained in the Bowels, and digeſted, are diſſolved by their ferments and heat; very many *Effluvia* come from them, which if they might obtain an open and free ſpace, would vaniſh away going into the Air, but they being ſhut up within a membrane, and gathered together; they conſtitute an heap of Vapours as it were wind: which oftentimes blows up and diſtends the Inteſtines, and which, way being given, ruſhing out, moves along with it excretions: But being ſhut up creates torments, and not rarely an inflation of the belly. Winds ariſing from the diſſolving of the Aliments in the Bowels, are begot after ſuch like manner, as when Pearls, Corals, or other Concretes being put into a Matrace are diſſolved by their *Menſtrua*: For very many vapours ariſe from their ſolutions, which if they are ſtraitly kept in, will enforce the Veſſel that contains them to fly or break to pieces. In like manner from the diſſolution or concoction, or fermentation of the Aliment within the firſt paſſages, very copious *Effluvia* ariſe; which being gathered together and ſhut up within the Membranes become wind: to whoſe more plentiful increaſe ſome other cauſes do contribute. For the colluctation and efferveſcency of Juices not rightly mixed do notably perform this: For that whiſt the adventitious humours, or heterogeneous things heaped together, and chiefly Medicaments do ferment with the other contents of the Inteſtines, from the mutual refraction of Particles very many little bodies proceeding, they are gathered together into a Vapour. Moreover from the blood it ſelf bubbling up, when as a copious breath every where flows out, ſome part of it breaking forth from the Arteries into the cavities of the *Viſcera* doth there increaſe the produced heap of Blaſts. But further yet, the extensions of the *Viſcera*, and their Convulſive Intumeſcencies, add to the more plentiful heap of Winds: For whiſt the Membranes by reaſon of the exploſions of the Spirits, and their inordinate excuſions, are very much diſtended; the internal Cavity as a blown up bladder is much enlarged, by reaſon that a portion of the included humour within that vacuity, as it were a Cucurbit after the fire is out, is rarefied into wind; which afterwards when the ſtiffneſs of the Membrane gives way, breaks forth with a force, or paſſes through the neareſt windings of the Inteſtines tumultuouſly. For this reaſon, when any part of the Inteſtine by an inflammation, or falling down of ſharp humours, ſhall be obnoxious to convulſive ſtretchings forth, alſo Winds continually brought forth become very troubleſom. When I have opened the dead bodies of many dying of an inflammation in the Colon; I found in all of them their whole Inteſtines diſtended to the utmoſt, and as it were blown up with Wind: Which without doubt happened, not becauſe the Wind firſt begotten had diſtended thoſe *Viſcera*; but when from the ſpirits of the Membrane greatly irritated, and thruſt forth among their Fibres, they ſhould be very much diſtended; therefore thoſe Blaſts were begotten to fill up the *Vacuum*, and ſo by conſequence ſecondarily. From this cauſe we have formerly intimated the Tympany to ariſe, as, in another place, perhaps we ſhall ſometime or other more largely declare. As therefore there is wont to be a very plentiful ſtore of Winds in the Stone or Gravel, in the Colical, Hypochondriacal, and Hyſterical paſſions, they are not, as 'tis commonly thought, the cauſes of thoſe Diſeaſes, but only the effects. Indeed whiſt by the Paroxyſms of thoſe Membranes the irregular extenſive Affections ariſe, and that the hollow *Viſcera* do ſwell up by the Spirits violently running forth, from hence preſently, that the empty ſpace may be filled, a certain humidity being ſhut up, is reſolved into vapours, from which the blaſts ariſe. Wherefore when the diſtention of the affected part is relaxed,

laxed, the Wind so suddenly produced is driven to some other place, by the falling down of the Membranes. So much concerning the Contents of the Ventricle and Intestines, which are the objects of cathartick Evacuation. Now, which next belongs to the same subject, let us enquire what the motion is of those *Viscera*, whereby these Contents being either leisurely carried along, are sent forth at their due times; or else being hastily thrust on, they are cast out by heaps.

Part I.

Because for the conservation of Life living Creatures ought to be repaired by often and plentiful feeding; there is a necessity therefore that the Aliment supply with nutritious juice the continual decays, and that the Reliques be timely removed, so that the old leavings of the Chyme may give place for new Provision. For after that a portion of the Chyle (in which the Elements being perfectly loosened, are freed from the bond of mixture) more pure and elaborate is pressed forth into the Chyle-carrying Pipes, what remains participating with the pricking Salt of a more thick Sulphur, contracts a most grievous stink: Wherefore it ought to be removed from the vicinity of the fresh chylous Mass, into the thicker Intestines, and at length wholly out of the Body. Whereby these things may be the better affected, Nature gives to the Intestines an almost constant, and as it were, solemn excretory motion, and constitutes various incitements or provocatives to that motion.

How the natural excretory motion of the Intestines is made.

1. As to the first, the excretory motion of the Intestines, as of the Ventricle, is effected altogether by the fleshy Fibres, composing the middle Coat of either of the *Viscera*, and we have taken notice of a double order or *series* of them in the whole passage of the Chyle, to wit, from the *Oesophagus* to the streight Intestine. The exterior order indeed of the intestinal Fibres, are stretched in length through all those *Viscera*, and strait upon the whole superficies; but the interior *series* or order, consists in circular Fibres compassing about on every side, as it were set thick with little Rings, the pipes of the Intestines; as it is represented in the third figure of the same Table. The Fibres of either kind being contracted together, do straiten the Cavities of those Intestines through all their dimensions: which whilst it is done successively and by one order after another, and as it were by jumps, there is a necessity that whatsoever is therein contained, should gently and even creepingly be carried along, the forepart being even thrust forward by the following part. This sort of motion of the Intestines is commonly called Vermicular, because it is continued from one part to another as in a creeping Worm; and is continually acted according to the use and needs of Nature more or less, without also our knowing of it; because indeed these *Viscera* ought to move away their burthen very leisurely: But lest that sometimes they should, being idle, desist from this task, they are urged as occasion serves by divers provocatives.

By what Fibres it is effected.

For in the first place the heap it self of the Chyle and the *Feces*; aggravating and so irritating with its weight the nervous Fibres of the interior Coat upon which it leans, impresses upon them a certain sense of the trouble, and thence presently as soon as they are filled with the nutritious Juice, and now growing weary of the rest of the Burthen, they instigate the fleshy Fibres to vermicular Contractions, for the further moving away the Contents. When by this means the Contents of the Belly being leisurely one part after another thrust forward, do descend near to the end of the *Colon*, because then the musculous part of the right Intestine feels a pressing; therefore the voluntary comes in the room of the natural Motion, whereby the *Sphincter* of the Arse hole being opened, and the Muscles of the *Abdomen* being compressed, the Excrements are cast forth of the doors. Moreover the Organs of Respiration do contribute something to this excretory motion of the Intestines, for that indeed they perpetually drawing here and there up and down the inferior Belly, whilst they so shake its contents, they make them to move gently forward.

By what provocatives the natural excretory motion is urged.

1. By the burthen and trouble of the feces.

Besides the aforesaid irritation, by which the fleshy Fibres by the instinct of Nature, and by an ordinary way are provoked into frequent and almost continual Vermiculatons, there happen yet some other provocatives and various incitements, which constrain or hasten as occasion is offered, those excretory Contractions, and not seldom compel them into compulsive; so that the Belly is forced to cast out its contents hastily and impetuously, as if they were provoked by a Cathartick. But these intrinsic irritaments of the Belly are in the first place incon-

Part I.

To which happen
many accidents
of other things.

Incongruous food
or depraved in
the concoction.

2. Cholera and the
pancreatick
juice.

3. Humours from
Blood, nervous
juice from their
Viscera, and
habit of the Bo-
dy being tran-
slated to the In-
testines are car-
ried away by
Stool.

How Cathar-
ticks bring a-
way the Contents
of the same Vis-
cera.

By what means
these do work in
a liquid form
and how in a so-
lid.

By what order
now on these
parts now on
those.

gruous or immoderate food, Corruptions of degenerate Chyle, plentiful excrements of the Blood and nervous Juice, or sharp overflowings out of the Glandula's and other Emunctories of the *Viscera*, and chiefly from the receptacle of the Gall and Pipe of the Pancreas, as also serosities, or superfluous humours or incongruous flowing from the Blood and from the stock of the Nerves, and from the inward disposition of the Body. Concerning the chief of these, because they arise oftentimes in purging, and do intend the operation of the Medicine, we will speak specially and briefly.

In the first place therefore, Aliments, if at any time they are perverted in their concretion, or will not be overcome, they do not seldom cause a *Diarrhœa* or lask, as it often happens in a surfeit, inordinate feeding, from unagreeable meats and other errors in Diet, or from the depravations of the ferment of the Stomach. Yea by reason of want of digestion, sometimes also through obstructions in the Mesentery or intestinal Pipe, by reason of too much viscidness sticking upon the glandulous Coat or mouths of the Vessels, that hinders the distribution of the nutritious Juice, and therefore the whole matter almost of things eaten, being retained in the first passages, produces frequent and plentiful Stools.

2. The excrements of the Blood and of the nervous Juice, being heaped together in the glandula's of the *Viscera*, the bag of the Gall, the pipe of the Pancreas, and perhaps in other receptacles; if at any time they flow over through plenitude or irritation; they are abundantly thrust down into the cavities of the Intestines, and in as much as they there pull or hawl the nervous Fibres, and with other Juices grow hot, they oftentimes produce a *Diarrhœa*. It seems the yellow Cholera is as it were a kind of natural Cathartick, which plentifully flowing forth of the Cholera-carrying Vessels moves a spontaneous purging.

3. An excremental matter from a yet more remote Region, to wit, either from the mass of the Blood, or from the nervous Liquor and its emunctories; or from the whole habit of the Body, being sometimes transmitted to the Intestines, irritates their nervous Fibres, and from thence stirs up the fleshy Fibres into excretory Convulsions. For in the aforesaid parts and places, and chiefly in the bloody Mass, the degenerate or superfluous humours arising up, when they are not easily or sufficiently to be sent away by evaporation or pissing, oftentimes a *Metastasis* being made within; they overflow thickly every where from the gaping mouths of the intestinal Vessels, causing very frequent and watry Stools. And truly sometimes the Blood it self, being vitiated into a thickness and apt to coagulate; when it cannot be circulated readily through these small Vessels, frequently breaks forth in great abundance, and causes a dysentery or bloody Flux. But it is to be observed, when the exterior Pores are shut up by cold, or the skinny tumours do suddenly vanish, a flux of the Belly succeeds. I have known many obnoxious to a constipation of the Belly, to have been cured by this kind of Remedy only; to wit, that they arose from Bed betimes in the morning, an hour sooner than they were wont. For how much the accustomed perspiration is lessened, so much is added to make slippery the Belly. These things being thus premised concerning the various Contents of the Intestines, both those inbred and accessory; and also concerning the excretory motion of these Inwards, both natural and ordinary and both violent and constrain'd, also concerning the various provocatives or irritations, by which the Belly by the accord of Nature is wont to be moderately loosed or more inordinately disturbed: It will be easie to shew by what means, and by what kind of strife purging Medicines do move the Ventricle and Intestines to excretions, and cause their contents to be carried forth, now these, now those apart, and sometimes many together.

When purging Medicines are taken in a liquid form, they are already enough prepared for the work, but if they consist of a solid substance, being taken into the Ventricle and dissolved by its ferment and imbued; they make, as it were, a tincture which becomes a Cathartick; purging after the same manner as the Liquor, according to the following means and reason. It seems that this kind of liquor, being first of all shut up in the Ventricle, and afterwards in the Intestines, by and by imbues the hairy filaments of the interior Coat with the Glandula's, and whilst it adheres closely to them, its Particles enter into the nervous Fibres, and both sanguiferous and Chyliferous Vessels, and irritate every one of these and also the Cholera-bearing Pore and pipe of the Pancreas to make them render their Contents,

Contents, and as it were to spue them forth. In the mean time the nervous Fibres of the interior Coat are hauled partly by the imbibed Medicine, and partly by the Humours pressed forth into its Cavity, the fleshy Fibres of the superior Coat begin the Excretorie Convulsions, whereby that which is troublesome might be removed. By what means these are done first in the Ventricle, and then successively in the parts and in what parts of the Intestines, and what sort of Humours are picked forth in the whole Passage, we will a little more accurately consider.

1. As to the Stomach it seems to be done after this manner following, viz. The Cathartick Tincture being diffused within the Stomach, it first of all imbues the hairy Raggs of the inward Coat, and adhering very closely to them, from thence it is delivered to the nervous Fibres, entering into which and quickly filling them even to saturity, at length it begins to irritate them; who therefore presently wringing themselves endeavour to put away the imbibed Liquor together with its proper Juice, and the viscus Phlegm laid up in the folds of the Stomach. Further certain other Particles of the same Medicine, while it stays in the Stomach, enter into the Mouths of the Vessels, and Glandulas, and pull them, and cause the Serosities in them and other Humours to be wrung forth, and emulged. And whilst that the Bottom of the Stomach and the nervous Fibres are so grieved and provoked by these kind of troublesome Contents, the fleshy Fibres being stirred up into excretory Contractions, they draw together the bottom and sides of the Stomach upwards and incline them towards the *Pylorus*; that its loading with the medicinal Tincture might be cast forth adoores, and be transmitted to the Intestines. After that the Stomach for a little while obtains a sedation and quiet rest, until that the nervous Fibres drinking in a new provision from part of the same Tincture sticking still to the hairy Filaments are again irritated; and so as a new loading is moved and expressed into the hollownes of the Stomach, the fleshy Fibres repeat again the excretory Convulsions for its casting forth, and this is so acted by turns until the Poyson of the Medicine be wholly purged, and wiped clean away from the hairie Raggs, and that the Spirits inhabiting the Fibres lay aside their angers; which sometimes quickly and easily succeeds, so that after an Hour or two the Stomach is free from any trouble impressed by the Medicine, the remaining perturbation being altogether translated to the Intestinal Region. But yet it very often happens, from a Cathartick being taken, that short but very sharp Vomiting is excited, and nevertheless though the Medicine be cast up, that a Purging plentiful enough follows. The reason of which is, for that too great and violent an irritation being made at the beginning, it stirr'd up more strong, that is, emetick Convulsions; then after that the force of that irritament was lessened or broken, the contractions became more gentle and Cathartick. For truly, the Virtue of a purging Medicine and of a Vomit, and the manner of their Working, differ not so much as to their specifick qualities, as chiefly in this respect, that the trouble given by the irritation of that is more easily and longer to be tollerated, that it may at length be transmitted to the Intestines, but not that which is excited by an Emetick. But that sometimes Vomiting arises, after the operation plentifully made by Stool, the cause seems to be, that the Tincture of the Medicine, being more deeply imbibed by the hairy Coat, is not easily wiped off; wherefore after very many purgative Endeavours had in vain, at length an Emetick Convulsion is stirred up for the thorowly shaking it off. It is a usual thing for the Stomach before it be emptied by a Medicine, to be stirred up to Vomit by things taken in with notable nauseousness and trouble, because indeed the Chyle by reason of an hindred or depraved Concoction degenerates into an incongruous and irritative putrefaction. But that the most part of the purging Medicine slides away too soon out of the Ventricle, and without clensing away its filths, spending its greatest strength within the intestinal Pipes: by what means this is done we will see next.

The Cathartick Tincture being thrust forth of the Stomach, and carying with it from thence a certain excrementitious matter, slides into the Intestines; where it imbues presently in the passage of the *Duodenum* and the superior *Ilium*, the Filaments or Raggs of the hairy Coat, and sticks closely to them: then the

Part I.

1. What their action is within the Ventricle.

To wit, in the first place they move the nervous Fibres into a Sense of the Trouble, then the moving Fibres into Excretory Convulsions:

whence the frequent change of these Motions proceed.

The operation of the Cathartick within the Duodenum and small Gut.

Part. I.

the medicamental Particles being plentifully poured upon the nervous Fibres, they also enter into the Pipes of the Glandulae and of other Vessels, and irritate the Spirits inhabiting them, and when they begin to wax hot with the Humours there abounding, they compell them as it were to be milked or pressed forth from thence, and so they stir up a great perturbation in them all; wherefore the fleshy Fibres being inflated and contracted by the irritated Spirits, and agitating into Explorations, fall into excretory Convulsions, for the shaking off that trouble. Hence when the superior Region of the Intestinal Pipe is provoked into frequent and strong Vermiculations, whereby the Contents might be driven further off, that motion of Excretion being begun is propagated to the rest of the Intestines, and those together being stimulated by the Contents of the Superior being thrust forth into their Cavities, fall into excretory Convulsions one after another, untill the *Faces* of the Belly which stay last of all be thrust forth of Door, others and then others coming in their places. The Cathartick Tincture as if infested with Spirits, irritates the nervous Fibres (as it hath been shown) into Corrugations, and dolorous extensions oftentimes, and the fleshy Fibres into Excretory Convulsions: then for as much as the same begins to ferment with the Humours, and the Contents of the Intestines, an Ebullition being made within their Cavities, and Blasts stirred up, it variously blows up, and distends the containing Membranes, and so causes the unloading of the Belly with wringing pains and with a noise.

The action of the Cathartick on the biliarie and pancreatick Pore.

Whilst that the nervous and fleshy Fibres are provoked into such sensible trouble by reason of the Spirits being irritated by the cathartick Tincture, and into excretory Convulsions, also the biliarie and pancreatick Pores being pulled and shaken, put forth their Humours, and as it were spew them forth out into the Cavities of the Intestines: both of which being poured abroad and especially more copiously from the Bile, the membranes being irritated as much as by the Medicine it self, they are urged into frequenter and stronger Excretions; and so when the stools are tinged by the yellowness of that Humour, it is said commonly (though falsely) that the yellow Choler is pick'd forth and peculiarly brought away by the Medicine. If that the Humours poured forth from these Pipes do mutually grow hot, and as some think do struggle one with another with a notable Orgasm or violent Appetite; for that a yet greater perturbation with a turgency of Humours, and Blast of wind within the Cavities of the Intestines, will be stirred up.

Also what it is on the Glandulae and Mouths of the Arteries.

Not only Choler and the pancreatick Juice are pressed forth by the Cathartick into the intestinal Pipes, but further the serous Humours are as it were milked forth from the Glandulae of the interior Coat, being straitned by reason of the Vellication, and the Mouths of the Arteries rubbed, and opened, which do wash more the Contents of the Belly, and both by making slippery, and by irritating move forward the Excrements. But the intestinal muck it self besmearing the hairy Crust is indeed washed out by the serous Humours wrung forth, and by reason of the nervous Fibres being wrinkled, and shaken, is wiped away, goes to the purgings of the Belly, and increases their heap. Truly sometimes this muck being very much wiped off, and the Mouths of the Vessels notably pulled and as it were shaven, meer Blood flowing out causes the Stools to be bloody.

The Energie of the Cathartick is extended upon the Blood, nervous Juice and Solid Parts.

Purgings Medicines, for that they irritate the Spirits, and ferment with the Humours, do after this manner perform their Operations within the Cavities of the Stomach and Intestines. But from what kind of Particles or Elements of the Medicine both this irritative Force and fermentative Virtue proceeds, we will anon inquire: In the mean time, we may observe that the Energie of the Cathartick is extended a great way beyond the first Passages, to wit, into the bloody Mals, and nervous Liquor, and so consequently somewhat to the Brain, *Præcordia*, and other Parts, or *Viscera*.

What its operation is in the Blood.

1. As to the Blood, it appears from hence that the Particles of the Cathartick is received into its Mals, and circulated with it, because by some, the Urine changes it Smell and Colour. Because the Milk of a Nurse taking Physick purges the Infant. Some Medicines evacuate the Waters of Hydropical Persons by Stool. The Refine of Jalap is wont to purge the lixivial *Serum* of the Smell of the Urine. Besides by the common observation, both of the Antients

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cients and of those of latter Days; a cathartick opportunely given in the declination of a Feaver, brings away the feavourish matter first made ripe, and apt to be separated. Wherefore it is beyond all doubt, that certain little Bodies of the Purging Medicine are admitted into the Blood, and spread abroad thorow its whole Liqueur. And indeed there is no long search to be made concerning the ways of its entrance, for that there is a necessity that some Particles of the Medicine, being thorowly mixed with the nourishing Juice, do creep thorow the milkie Vessels. Further when as certain of the Veins as a most thick Wood are every where inserted into the interior Coat of all the inward Parts of digestion, it will be obvious enough to conceive, that some Particles of the Medicine, as well as of the Aliment are carried into the Blood by these Pipes, which being diffused in a great abundance first within the Veins, and afterwards also within the Arteries (whilst that they are altogether heterogeneous and untameable) do agitate its Mass, and variously scatter it, and provokes an exclusion of it self together with other excrements of the Blood. But the Blood so scattered abroad, and stirred up into excretory fermentation, thrusts down the Particles of the Medicine, together with other recrements to be purged forth by the little Passages of the Intestinal Arteries at that time also pulled and opened by the Medicine, into the Cavities of their *Viscera*, from whence by and by they are sent away by Stool. After this manner, the serous Filth, and Superfluities or Corruptions of the Blood are purged forth, from the Mass being sent together with the Cathartick Tincture to the Intestines. Moreover when as Sanguiferous Vessels being by this means to be filled, other superfluous or recrementitious Humours being first deposited about the *Viscera*, *Præcordia*, Brain, or habit of the Body, are swallowed up in the bloody Mass, and presently from thence, during its Excretory Effervescence, being snatch'd rowards the Intestines which way is then open, are cast forth adoores; and so after this manner Cathartick Medicines operate on the whole Body, and carry away from the Parts howsoever remote the Incongruous, and to be exempted Matter.

This is performed partly by fermentation, partly by irritation.

As we have already noted three degrees of the humoral *Diarrhœa* or natural Cathartick, so now it seems best, that we constitute so many species or Classes of medicinal Purgation. The first of these is when by reason that the nervous Fibres of the Intestines being gently provoked, the fleshy Fibres being contracted more straitly and more often a little above their wonted manner, they move forward their more loose Contents, more swiftly from one part to another, and at length gently cast them out of Doors. In the second species of Purgation, some Humours besides, being wrung forth from the biliarie Pore, the Pipe of the *Pancreas* and the Mouths of Vessels hauled by the Medicine, are thrust forth together with the *Fæces* of the Belly. In the third these Pipes being more vehemently provoked, they pour forth into the Cavities of the Intestines a great plenty of every kind of Humour, and further a recrementitious matter both from the Blood, scattered, and precipitated by reason of the admitted Particles of the Medicine, and by consequence also from the nervous Juice, and other Parts, is purged forth being carried by the Arteries to the Intestines.

Three degrees of Cathartick Operation.

I think it appears plain enough by these that a Cathartick acts only by irritation, fermentation and expulsion and not (as is commonly said) by Attraction; nor does it indeed become a reasonable Philosopher nor any that hath the use of ratiocination to affirm any Medicines by reason of similitude of Substance, or I know not what Specifick Virtues to act upon any determinate Humour and to carry it whole and by it self out a Doors. But that sometimes Choler, Phlegm, Matter, *Serum* or Melancholy is judged to be separated apart one from another, that seems to be so done, either because Medicines do irritate in the *Viscera* after a diverse manner, or they ferment with the Blood and other Humours by various means, or lastly they put the Tincture in the Stools themselves. It will be worth our while that we shew some reasons and instances of every one of these.

Catharticks do not operate by Attraction or Election.

First therefore, Medicines do irritate within the Cavities of the *Viscera* after a divers manner according as they contain more volatile or fixed Particles, more gentle, or more eager, more soft or more asper, and for that cause stir up now in these places now in those sooner and rather more light or stronger Excretory Convulsions. Of these kinds are Roses, Violets, Callia, Manna and

The difference and reason of the operations of Catharticks.

others

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others the like, which are of subtil parts and very tenuous, and for the most part do not disturb the Ventricle; but being come to the *Pylorus*, they begin to irritate the more exquisitely sensible nervous Coat of of the *Duodenum*, and before they go any further they there spend almost all their whole Strength; and so as the biliary Pore is shaken by the pulling and corrugation of that Coat, bilious Stools follow.

1. For as much as they irritate after a diverse manner in the Viscera.

On the contrary others, as Gumm Ammoniack, *Opopanax*, *Sagapenum*, Turbith and the like, which consist of a thicker and more viscous matter, and more obdurate Particles, are not of so prompt an operation, that they should presently irritate; but being dissolved within the Ventricle, and thence sliding into the Intestines, and being brought into them not presently, but after some time, and after that they have for a while adhered to their Coats, they begin their Vellications beneath the biliary Pore, wherefore they shave and wipe away besides the faces of the belly, and certain serosities pressed from the mouths of the Vessels, the filth besmearing the Intestines, and therefore they cause the appearances of pituitous Stools.

2. For as much as they ferment variously with the blood.

2. For as much as Medicines indued with Particles of a diverse kind, do ferment after a diverse manner with the Blood and other juices; therefore follow now ferrous now bilious Stools, or else of another kind. For some, as chiefly Aloes and Rheubarb; because they contain in themselves Particles as it were of an adust matter, they beget such in the Blood; and so also stir up its adust excrements into motion, and force more plentifully into the choler carrying Pipes: And for this reason when the Bile more copiously heaped together, flows from its receptacles into the Intestines; the Stools become more bilious. I have known some accustomed to be purged by drinking two pints of simple raw Milk, to cast out by Stool nothing but yellow choler: The reason of which is, for that Milk it self goes into choler, as may be inferred from the bitter belching, and the heat of the Blood (as it were swelling bile) being quickly stirred up. Further, other Catharticks as *Jalap*, *Coccythida*, *Elaterium* and certain preparations of Mercury consist of more sharp and not seldom as it were maturing Particles; wherefore the which being received by the Intestines, and from thence transmitted to the Blood, notably disperse its Mass, and precipitate it very much into serosity: Yea sometimes they as it were poyson and corrupt its *Crafsis*, or natural Complexion. Then indeed at the same time in which the Blood is scattered abroad, there is a vellication in the Intestines, and the ferous excrements of the Blood, and its corruptions and melted fats are spewed forth into the cavities of those *Viscera*, from the mouths of the Arteries there opened; and so they induce very watry Stools. If that after the Blood so scattered abroad by the Medicine, and hurt in its natural Complexion, a little or no plentiful evacuation follows by Stool; the Blood being even more depraved by the incongruous mixture and corruptions, acquires from thence either a notable Dyscrasie, or pouring forth its recrements and corruptions into the habit of the Body, causes pustula's and watry bladders to break forth in the skin. For so from a greatly used Evacuation inconveniently made, oftentimes great evils follow: Neither is it for nothing that the common people are so afraid, if at any time the Medicine should work but little, lest the Virulency contracted and left from thence, should lye hid a long time after in the Body, and at length produce malignant Diseases: For sometimes from such an occasion as it were leprous passions, or alterations of the senses are stirred up; so not long since when as a Cathartick Powder (and as it seems Mercurial) was exhibited by an Emperick to two Sons of a certain Oxfordian, one of them was purged in the space of forty eight hours a hundred times at least, with great torment and swooning away of the Spirits: In the mean time the other being a little older had no Stool, but within a few days his Hair fell off, his Nails grew black, and moreover in a short time after watry Pustulaes broke forth through his whole Body, which growing hard into a crusty Scab, and then falling off, presently new ones sprung up again: This kind of Disease, by reason of the complexion of the Blood highly vitiated, and as it were, poysoned, yielding to no remedies, exercised most grievously this poor Wretch, above two years before it could be perfectly cured. Not only from Mercurial Medicines, but sometimes from other Catharticks taken from the family of Vegetables, the Mass of the Blood is so depraved, that it cannot be restored or renewed but in a long time after: So that *Helmont* doth not altogether undeservedly caluminate, saying cathartick Medicines do not always or only bring away the humours

The evils of Elaterian or stronger Purging.

Shown in a notable History.

humours first existing in the Body, but by their corrupt power cause them to be depraved.

3. The error of elective Purgation carries its Roots yet more deep, for that when sometimes the liquids thrust forth through the Belly, change their Colours from the Medicine; 'tis falsely believed the bilous and melancholy first existing to be brought away apart from the other humours, there is nothing more usual than from Rhubarb, Aloes, the roots of *Cucurma*, and certain other medicinals being taken, as the Urines so the Stools to be tinged with a yellowness: In like manner the infusion of *Senna*, also Catharticks in which Chalybeats or Vitriolicks are mixed, dye the faces of the Belly which they evacuate with blackness. Further the diverse constitution of the Body, and disposition of humours produces divers appearances of Excrements. Because when the Choler-carrying Vessels swell with Byle in these, the Salts of the vitriolick Tincture in these, being black Parents are housed in the first passages; and in other places through the ill means of living, very many serosities are heaped up in the whole Body; wherefore when these kind of Stools follow from any medicine whatsoever, if that these humours commonly called Cholerick or derived from the Choler, those from the heat of melancholy or these watry happen to be purged, such are affirmed to be picked forth by the elective Medicament. What therefore belongs to the choice to be had in purging Medicines, notwithstanding that those cryed up classes of Medicines appropriated to this or that juice, do not please; yet we think that any Catharticks in all cases are not indifferently to be usurped, but that it is the work of the judgment of a prudent Physician, and of a sagacious discerning, that according to the strength, temperament, the ability or tenuity of the *Viscera*, bearing, custom and imagination of the Patients; yea, according to the nature, time, and condition of the Disease, that a purgation gentler or stronger, from hot or temperate things gentle or more sharp, in solid substance or liquid, or some other of another kind or form, be prescribed.

The more ancient Physicians, with whom also many Neotericks agree, did ordain a previous preparation of the humours for elective Purgation, as necessary to it: Wherefore in their practical Books as often as cathartick Evacuation is prescribed, a long series of destinated preparations for every humour, in a solemn manner as it were with a certain pomp is proposed; the use of which though specious enough seems not to be profitable; because in truth there are no such humours, as we shall shew clearly in another place. But truly as a purge is not convenient at any time, nor in any state of Body, that you may go about it rightly; both opportunity and a certain preparation is required, and both these respect the first passages and the sanguinous Mass.

As to the first, if at any time the Stomach is burthened, either with the loading of a viscous Phlegm, or is troubled with an Aëstuation of turgid Bile, a Cathartick is very often used in vain or unhappily, unless these Contents are first of all bruised out by a Vomitory, or their aggravation and effervescency mended by Digestives.

But as to what belongs to the Blood, Purging is oftentimes unseasonable, and sometimes also incongruous; but in neither of these cases are the ordinary preparations convenient, but only Alteratives: Because not these imaginary humours are to be disposed for evacuation, but the Blood it self ought to be reduced either from its troubled and confused state, to a quiet Condition; or from a Debility or Dyscrasie to a strong and equal temperament. Whilst that the Blood feavourishly boiling is disturbed in its mixture, a Purge is always conceived to be hurtful; and therefore condemned by *Hippocrates* and the Ancients: No less are those Evacuations forbid whilst its Mass being languid and weak, doth not arise to due fermentation. Further, when the Blood is above measure bilous or watry, or is too much inclined either to Coagulations or Fusions, Purgings and such kind of drainings, do not move away its depravation, but oftentimes augment it. But in these cases alterative Remedies are rather prescribed, which may destroy the wicked Combinations or else the Separations of the Salts, Sulphur, and Serum, and take away their enormities: But concerning these Medicines of cathartick Evacuation, either previous, or which is often better, these supplying its turn, viz. Digestives and Alteratives, we speak of them specially hereafter.

There do not occur many more things to be spoken concerning the Theory

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Part I.

Whence the error
of elective Purga-
tion begins.

The preparation
of the humours
not necessary to
purging.

What preparation
is required for
purging.

1. In respect of
the Stomach.

2. In respect of
the Blood.

Part 1.

A double faculty or virtue of a Cathartick; irritative and fermentative.

By what elementary Particles either of them depends.

The irritative doth not proceed from Spirit, Water or Earth.

Nor from Salt or Sulphur alone.

But from them combined together.

On what kind of Particles the fermentative virtue depends.

The Cathartick force of a Medicine from Sulphur, we call a volatile Salt, and as it were putrefactive.

The more strong Catharticks work by stool even as Cantharides by the urine.

of purging Medicines, besides truly (as appears by what has been already said) Catharticks irritate both the Spirits inhabiting the Splanchnick Fibres, to wit, these into troublesome Sensations or Feelings, and therefore the others into excretory Contractions, further ferment both the humours and the Blood, and compel them into various fusions and separations of Parts: It rests that we enquire upon what kind of Particles, whether elementary or secondary, and (as I may so say) Qualitative, this double Virtue both irritative and fermentative depends. Concerning these in general we observe, which afterwards shall be confirmed by instances, the irritative force which uses to shew it self in the *Viscera*, and by whose instinct the cathartick Convulsions are provoked by no means to proceed from the principles of the Medicine either spiritual, watry, or earthly Particles, neither from the Saline or Sulphureous alone by themselves, but to arise from them always combined, and sometimes with others joyned to them. For although Salt and Sulphur are the chief Instruments of cathartick Irritation, yet neither of them simple uses to be so infestous to the *Viscera*, as that it should stir up the moving Fibres into Excretory Convulsions, but they conjoynd together, do mutually exalt one another, and inforce into little prickings, yea acquire an inimical, and indeed an untameable disposition to our Body. The tincture of Antimony, also its Ceruss brings no trouble to the Stomach, but are rather grateful, and Cordials. But the Crocus of Metals, *Stibium*, the butter of Antimony, and others prepared out of Sulphur and salt conjoynd become Emeticks or great and strong Catharticks. In like manner we somewhere observe the saline and sulphureous Particles separated one from another, and by themselves, to be grateful enough in smell and taste, but those being intimately commixt presently to attract a Feter and rammilhness.

But as to what respects the Cathartick Fermentation, it doth not so plainly appear whether indeed the same Particles which irritate the Spirits into Excretory Convulsions, do also scatter the blood, and make it to separate into parts, so that they may cast forth its Excrements into the Cavities of the *Viscera* from the mouths of the Arteries. Truly the Blood even as milk is for the most part scattered and precipitated into ferosities only by acid things; as shall be hereafter largely declared by experiments and reasons. The Alcalé salts fixed and volatile and also Nitrous do not dissolve the Mixtion of the Blood; but rather preserves it whole, and being soluted restore it; and in like manner do the Spirits of Wine and other most pure Sulphureans: But let the acid salt only be wanting to promote the Cathartick, the purging force of Medicines may be broken, or wholly taken a way by nothing more.

Therefore that we may give our judgement concerning purging Medicines, examination being made by the sense, it seems most likely, that they imbued (being for the most part of a sharp taste and somewhat pungitive) with a certain volatile and sharp salt, together with Sulphur, (which salt in the more strong is as it were Septick or Putrefactive) but these their sulphureous saline particles do not scatter the Blood by means of the acid or other precipitatory salts, for as much as whilst they embrace more intimately and friendly certain parts of it, they snatch them away from their other companions, and bind them to themselves; but on the contrary the Cathartick Particles being incongruous to the whole bloody Mass, and to all its Particles, and as they are immiscible and untameable, they agitate all those with their confusion, and stir them up to an expurgative effervency; which, there being presently received a more quick pulse of the Heart, is not quieted before all Heterogeneous Bodies be cast out of doors, a certain portion of the ferous Humour wherewith they are mixed being expelled with them and sometimes other excrements of the blood. The bloody Mass being infected after the like manner by the Particles of a strong Cathartick grows hot, even as generous Wines, heterogeneous things being cast into the But, are said to ferment anew, for the exclusion of that incongruous thing, so that sometimes they boyl up within the Cask, until that either the Vessel be broken, or that their Complexion be thorowly vitiated. But this doth not so frequently happen to the bloody Liquor, because both the incongruous Particles of the Cathartick, and others of the Blood vitiated and separated by them, cast out by the Arteries and scattered on every side, and especially more widely opening, into the Cavities of the Intestines. However sometimes the more vehement purgers greatly pervert the Temperament of the Blood, and as it were poyson it. But truly some of them planely putrefactive, and corruptive, do work

by

by stool after the like manner, as Cantharides by urine; to wit, they melt and corrupt in part the sanguinous Liquor, then its meltings being rejected with the particles of the Medicine, for their sharpness, they very much irritate the parts which they pass thorow, and often corrode them. Wherefore they who have a care of their health or life, must shun Empiricks, using for the most part only Mercurial or Elaterian evacuation, more than a Dog or a Snake.

Part I.

CHAP. II.

The Kinds and Forms of Purging Medicines and the Reasons of their Compositions.

Minerals do not contribute much to the Class of Catharticks; although the more celebrated Vomitories and Diaphoreticks are chiefly taken out of its store: But Purgers for that they are of a middle vertue and of a diverse Operation, will not be made out of those impure and hard Concretes. For if that any elaterian force be left, how correct soever it be, as it were some sharp prickings in the mixture, whatsoever of irritation proceeds from thence in the Ventricle, induces vomiting, but if those be wholly taken away, no Excretion is stirred up in the *Viscera*, but by reason of some reliques of the alchale Salts, of all it once runs into sweating. For indeed emetic Medicines seem to be of that sort, which, when they can by no means be subdued in the Ventricle, and tamed, and are indued with more sharp and as it were pricklie, to wit, sulphureous saline Particles, provoke the stomachal Fibres violently into excretory Convulsions, whereby they might be thence exterminated in a moment by the shortest way, to wit, by Vomit: on the contrary Diaphoreticks, though they cannot be overcome and tamed, yet indeed their Stimulaes or Prickles being taken away, their Particles are broken into small as it were globular or round bits, and free from Prickles, do not irritate the Stomach, but passing into the Mass of blood, ferment that, being immiscible, and not to be tamed, and stir up an universal effervency, whereby they may evaporate with the ferous juice, and other excrements of the Blood. But purging Medicines being indued with incongruous, but yet more blunt and weaker Particles, do not presently or vehemently irritate the stomachal Fibres; but yet after they have entered them a little more deeply, they first move a troublesome sense, then that they may cast forth a doors what is troublesome, without much perturbation; they cause the wonted and ordinary excretory motions, to wit, by the intestinal Pipes to be increased and multiplied.

Scarcely any Catharticks out of minerals.

The chief Emetics and Diaphoreticks are taken out of that store.

The reason of this difference inquired into.

But yet some from Minerals as *Mercurius dulcis*, *Lapis Lazuli*, the Armenian stone, and some others though improperly are numbred with Catharticks. for they are not of a trusty or certain operation, therefore should be rarely given by themselves for that end, but with other purgers are given not without benefit.

Some purging Medicines not properly so called out of Minerals.

But descending to Vegetables, we here enter into a large field, and thick beset with Catharticks: which, for that they are many, are wont to be numbred, and distributed in various manners; to wit into more gentle, more moderate, and more vehement, also into such as carry away Choler, such as carry away Melancholy, such as carry away Phlegm, and into such as carry away Water: further into purgative minoratives or lesseners and eradicates or rooters up. It is not for us to insist upon every one of these Tribes, but we shall reduce the whole Cathartick store to three kinds only, to wit, in the first place to be reckoned those which cause a light irritation in the *Viscera*, and only a gentle fermentation in the blood and humours: of which kind are Violets, Calia, Tamarinds, Roses, Rhubarb, Senna, Myrobalans, *Epithymum*, *Carthamus*, Agarick, Aloes, and the like. In the second place such as stir up both a vellication in the *Viscera*, and an effervescency in the humours more strongly, for as much as by these, great perturbations, and sometimes feavourish, by those convulsions with pains though not very great are excited: in which Cense are placed Scammony, Turbith, Hermo-

Very many Catharticks and of various Kinds from vegetables.

A numbring of Purgers.

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daçyls, Mechoacan, Jalap, Danewort, Elder, Opopanax, *Sagapenum*. Lastly are placed such as cruelly pull and tear the Ventricle and Intestines, yea thorowly agitate, diffuse, and separate the blood and other humours in their mixtion, with a certain septick or putrefying force: such are Hellebore, *Elaterium*, *Soldanella*, *Euphorbium*, Spurge, *Colocymbida*. &c.

Vegetable catharticks do not want much chymical Preparation.

Vegetables have not always as minerals, need of a long preparation to unlock their close-joynted Powers; for these oftentimes, whilst that the mixtion is whole (but of those we have observed otherways) do operate more strongly. For the vertue of these consists in a subtil and fugacious *Systasis*, and need not to be reduced by great labour and chymical preparation into Extracts, Magisterials or Quintessences, but very many of them as Rhubarb, Manna, Cassia, Senna, Myrobalans, &c. being reduced into little pills or powders, or infused in a fit liquor or decocted, work both better and easlier; which if vexed by too much artifice, either they wholly cast away their purgative force, or they exercise it slowly and with trouble. It is an usual thing for the drawing forth the Tinctures of Vegetables, to impregnate the liquor into which they are put with the salt of Tartar or of Wormwood, for so they obtain a deep colour. Although I do not disallow this way, for as much as the fixed salts of the herbs do boyl up with the acid juices of the Ventricle and Intestines, yet the deceit lying in it ought to be done away: for that the salts do

Some of them are made better by extraction.

What the Salt of Tartar contributes to the extraction of purging tinctures.

not draw forth that tincture, but make it appear. For if you add the salt of Tartar to the infusion of Rhubarb, Senna or other Vegetables already made, and strained, forthwith its Tincture or Colour becomes much more deep: the reason of which is, for that the fixed saline Particles being something blunt do fill up the pores of the liquor, so that the beams of the light are very much broken in passing thorow them: for which reason every Tincture is made deeper because of the salt of Tartar, by the spirit of Vitriol being infused therein, whose Particles are sharp poynted, without the precipitation of any matter becomes presently more clear and thin.

Chymical preparation for resinous and saline extracts very useful.

But truly some of the vegetable Catharticks are likewise mended by a Chymical preparation: for from some filled with Salt and Sulphur the active and benign Particles may be picked forth from the remaining more dull and malignant, and reduced into resinous Extracts or some other compendious things of another kind; the Analysis and short composition of these is certainly instituted, with very good profit. Wherefore for the rightly preparing certain Catharticks we draw forth with the spirit of Wine, the sulphureous and something the saltish part, as in the Magisteries of the Resin of Jalap, Scammony, Mechoacan &c. For others we use Saline *Menstruums*, to wit, distilled vinegar, or waters exacuated or made sharp with the spirit of Vitriol or salt of Tartar: and that for a double respect; to wit, either that the active Particles being separated from the terrestrial matter, the Medicine may be composed in a lesser heap and more elegant form; or that all the fierce or virulent mixt qualities may be taken away or subdued.

The chief Forms of purging Medicines are noted.

It would be a business of infinite and tedious labour, to recount here all the simple Catharticks, their preparations, dispensations, and doses singly: what is enough for our purpose, as the chief compositions of purging medecines, are Potions, Powders, Boles, Electuaries, Morsels or Tablets, and medicated Ale or Wine, we shall shew the more select prescriptions of every one of these, and those of a threefold kind, according to which the operation of the Medicine ought to be gentle, moderate or strong; to which fourthly are added Receipts of easily prepared Medicines for poor people.

Potions gentle.

I. Gentle Potions. R Rhubarb sliced ʒiij, yellow Sanders ʒβ, salt of Tartar ʒj, put them all night into cold water of Chicory and white Wine ʒijβ, to ʒiij strain'd, add of Syrup of Chicory and Rhubarb ʒβ, water of Cinamon ʒij. make a potion.

Moderate.

2. Moderate. Take of the best Senna ʒiij, of Rhubarb, Thochoes of Agarick of each ʒjβ. yellow Sanders ʒij, of the salt of Tartar ʒβ, of Coriander seeds ʒj. infuse them close all night in spring water and white-wine warmed of each ʒiij, of it strained ʒiiij, add to it syrup of purging Apples ʒj, water of *Mirabolans* ʒij, make a Potion, or take of the decoction of *Sen*, *Gereonis* ʒiiij, of the syrup of Roses Solut. ʒj, of the Cream of Tartar ʒβ, Cinamon water ʒij, make a Potion.

Take of the best Cassia Fistula, of Tamarinds of each ʒβ, Coriander seeds ʒij, boyl them in ʒx, of spring water till a third part be consumed, take it, clarify it with the white of an Egg, strain it and add thereto of syrup of Pippins ʒj, and the Potion is made.

3. Strong

3. Strong. Take of the Decoction of *Sen. Gereonis* (with the addition of the Strings of black Hellebore and Agarick of each ʒiʒ) ʒvj. Of the Syrup of Roses Solut. or the Flowers of Peaches ʒj. of Water of Mirabolans ʒij or.

Part 1.

Take of the best *Senna* ʒʒ, of the extremities of black Hellebore and Turbith of each ʒij, of red Sanders ʒj, of coriander Seeds ʒiʒ, of the Salt of Tartar ʒʒ, make a close Infusion and warm of white Wine ʒviii, all night, of the clear straining ʒv, add to it of the Electuarie of the Juice of Roses ʒiij, of the Syrup of the purging Thorn ʒvj, Cinnamon Water ʒij, the Potion is made.

Strong.

4. Potions easie to be made for the Poor. Take of purging Line one hand-ful, of sweet Fenil Seeds ʒij, boyl them in as much spring Water as will suffice to ʒvj, adding thereto of white Wine ʒij, the Potion is made. After the same manner may be prepared a purging draught of the Flowers of Damask Roses, also of Peach Leaves, also of the Roots of the *Eupatorium* of *Avicenna* or *Agrimony*.

Easily prepared.

2. Pills. First of easie operation. Take of Stomach Pills with Gumms ʒj, to ʒʒ, of Tartar vitrioleo *gr.* ij, of the Balsom of *Peru* what will suffice make thereof 3 or 4 Pills. After the same manner may be made Pills out of the mafs of Pill, *Ruffi*, Mastick, *de Succino* or Amber, also of our Extract Solut. the description of which may be had in the Tract of the Scurvie.

2. Gentle Pills.

2. Moderate. Take of Stomach Pills with Gumms ʒʒ, of the resign of Jalap *gr.* iiii to x, of Tartar Vitriolat. *gr.* vj, Gum Ammoniack dissolv'd as much as will suffice, make Pil. iiii. After the same manner may be made Pills out of the mafs of Pil. *de Succino*: *Tart. Quercetan.* Also in the place of Refine of Jalap may be put of Sulphur of Scammonie *gr.* vj to xij, or of the Refine of Scammonie *gr.* viij to xiiij, or take Pil. Stom. with Gums, ana ʒj of the Refine of Jalap *gr.* vj to xij, as much of the Balsam of *Peru* as will suffice make Pil. iiii.

Moderate.

3. Stronger. Take of Pil. *Rud.* ij ʒʒ of the Refine of Jalap *gr.* viij to xij, of the Balsom of *Peru* what will suffice, make Pills iiii to be taken with governance. After the like manner they may be made out of the mafs of Pill *Cochie*: *de Sagapeno*. Take of Pil *ex Duobus* ʒ to ʒʒ. *Calomelanos* ʒj make iiii, to be taken with governance.

Stronger.

4. Easie to be made and of lesser price. Take of the choice Pouder of Jalap ʒij, of Diagridium ʒj, of Cloves and Ginger, of each ʒj, Ammoniac Solut. what will suffice, make a mafs, the Dose is ʒʒ.

Easie to be had.

3. Pouders. First the more gentle. Take of Rhubarb the Pouder ʒʒ, of the Salt of Wormwood ʒʒ, of Cloves *gr.* ij, make a Pouder, let it be given in a spoonful of small Cinnamon water, or in a draught of Broth.

3. Pouders gent.

Take of the Pouder of the greater composition of *Sena* ʒʒ to ʒj, in a draught of Posset drink.

Take of the Pouder of the Leaves of *Sena* ʒj, *Calomel.* *gr.* xvij, yellow Sanders ʒʒ, make a Pouder, let it be given in a spoonful of Panada.

2. Moderate. Take of the Pouder of Diasen. ʒj, of Creme of Tartar ʒj, make a Pouder, let it be given in a draught of Broth.

Moderate.

Take of the Resin of Jalap *gr.* x, Calamel ʒj, Cloves *gr.* vj, make a powder taken after the like manner.

Take of the Species of Diatribith with Rhubarb ʒʒ to ʒj, of Creme of Tartar ʒj to ʒʒ.

3. Stronger.

3. More strong. Take of Turbith, Hermodactyles ana ʒiij, Diagridium ʒj, Ginger ʒj, make a Powder, the Dose ʒʒ to ʒj.

Take of the Powder of *Cornachini* ʒj. After the same manner may be given the Powder *Hermodactyl. Composit.* also the Powder Hydrotick of *Riverius*.

4. Cheap and Easie to be got. Take of the Powder of the Roots of select Jalap ʒj, of Ginger ʒj, let it be given in a draught of white Wine. In like manner the Powder of the Roots of Mechoacan, also the Leaves of *Sena* to ʒj may be taken in any Liquor.

Easie to be got.

4. Boles and Electuaries. First such as work gently.

Take of Electuary Lenitive ʒʒ, of the Cream of Tartar ʒʒ, Syrup of Roses ʒj. make a Bolus. Take fresh Cassia ʒʒ, Powder of Rhubarb ʒʒ, Cream of Tartar ʒj, Syrup of Roses what will suffice, let a Bole be made.

4. Boles and Electuaries.

2. Moderate. Take of Elect. Lenitive ʒʒ, of Cream of Tartar ʒʒ, of Refine of Jalap *gr.* vj, Syrup of Roses what will suffice to make a Bole.

Moderate.

Take

Part I.

Stronger.

Take of electuary *Diaphenici* ʒβ, powder of *Hermodactyls* compounded ʒβ, Syrup of Elder what will serve: Let a Bole be made.

3. Stronger. Take of Electuary of the Juice of *Roses* ʒβ, Resine of *Jalap gr.* x, Cream of Tartar ʒβ, Syrup of Elder as much as will make a Bole.

Electuaries are compounded out of the same Compositions in a greater quantity, by adding conferves of Damask *Roses* or of Peach Flowers: The dose to be taken betimes every morning, or twice or thrice a week, is the quantity of a Chestnut.

Easie to be had.

4. Boles and Electuaries easie to be gotten. Take of the Powders of the Roots of *Jalap* ʒj, of *Mechoacan* ʒβ, of *Ginger* ʒij, of *Cloves* ʒj, of Cream of Tartar ʒij, of the salt of *Wormwood* ʒj, of *Sugar* ʒij, Syrup of *Roses* solutive what shall suffice: Let an Electuary be made. The dose is the quantity of a Walnut.

Solutive Confections and laxing Sweetmeats, the *Diaprunum* of *Sylvius* in the thirtieth Page of the practice of Physick.

Morsels or Tablets.

5. Morsels or Tablets of moderate operation. Take of the powder of *Mechoacan*, Turbith Gummos, of each ʒβ, of Scammony sulphurated ʒij, of the Resine of *Jalap* ʒj, Red Sanders ʒj, Cream of Tartar ʒij, Conferves of Violets ʒj, of *Sugar* dissolved in Rose-water and boyled up to a consistence, j pound and an half, make Tablets weighing ʒj. The dose j or ij of the purging Tablets; Page 18. of the Praxis of Physick, *Sylvius*.

Medicinal wines and Ale.

6. Medicated Wines and Ale or moderate Purgers. Take of the leaves of *Senna* ʒiβ, of Turbith, of *Mechoacan*, of each ʒvj; of the strings of black *Hellebore* ʒij, Cubebs, Galingal Roots, Cinnamon bruised, of each ʒij: Let them be put into a large Glas with 4 Pints of Rhenish Wine, of salt of Tartar ʒiβ; let them stand cool and covered for six days, add to it *Sugar Candy* ʒij, and pass it thorow the sleeve of *Hippocrates*. The dose is ʒij or iij.

Take of the leaves of *Senna* ʒij, of the Roots of *Polypodium* of the Oak, and of sharp pointed Dock prepared of each ʒij, of Turbith, of *Mechoacan*, of each ʒiβ, of *Epithymum*, Red Sanders, of each ʒj, Coriander seeds ʒiβ, let them be sliced and bruised, and let a bag be prepared according to Art for 4 Gallons of Ale. The dose ʒxij to a Pint every morning, or twice or thrice in a week.

The Reasons of some Chymical Preparations.

Mercurius Dulcis.

Mercurius dulcis.

Take of the corrosive Mercury sublimate ʒvj, of the best purged Quicksilver ʒiiijβ, let them be bruised together in a glas Mortar to a perfect mixture, then let them be sublimed in a sand Furnace, with a fire increased by degrees to the height for 12 hours: Let the sublimation be repeated again and again, adding the Mercury which beccmes crude in the subliming. At length, the matter being perfectly sublimated pure and white, let it be gathered together and the excrements done away, and kept for use. The dose is from gr. xv to xxx, by it self, or with Catharticks added to it, which may carry down the Mercury quickly by Stool, without danger of Salivation.

The sublimate Corrosive Mercury, out of which Mercurius Dulcis is made.

The corrosive sublimate Mercury.

Take of Calcined Vitriol lbj, of Sea Salt calcined, of the best Nitre, each lbβ, of purged Mercury lbj; let them be beaten in a glas Mortar or Wooden, to a perfect mixtion, by adding a little of *Aqua fortis* or spirit of Vinegar; let them be sublimed

sublimed in a sand furnace, by a fire gradually increased to the height: Let the work be repeated if need be, that the matter sublimed to the sides of the Vessel, may obtain a Snow white colour. This work proceeds much more easily, if the Quicksilver be dissolved in *Aqua fortis*, distilled out of the aforesaid Minerals: then let the matter, the humidity being abstracted, be sublimed with an intense fire.

Part I.

As to what respects the *Ætiology* of the aforementioned Medicine, first concerning the Corrosive Sublimate, it is plain enough that the Mercury is dissolved by the Salts (whether they lye hid in the Minerals themselves, or in the *Aqua fortis*;) and coagulated as it were with them, is carried on high by the strength of Fire. Further, that from the same Salts congealing the saline Particles of the Mercury, and hiding themselves within its other Pores, the colour like Snow is produced, and together that by reason of the little superficies of the same Salts being highly sharpened, the Corrosive Force doth proceed. Then that by a repeated sublimated Sublimation afterwards, the Quicksilver being added and incorporated almost in an equal Quantity, that acritude may be taken away; the reason is for that the saline Particles are so bruised and broken by the Mercurial Particles, being increased in abundance, and every where growing to them; that they do not dig and lance the sensible Fibres as before: Besides the powder of this Sublimate being bruised in a Mortar grows yellow, by reason of the plenty of the Mercury, as it were, emerging. But that the common precipitate, in which the mercurial Particles are greater than the congealed Salts, is highly corrosive, the reason is, because the little Bodies of the Fire make sharp all mineral Particles, in as much as they take away all their softnesses, and stick close to them with their exceeding sharp pricking Bodies.

The reason of both.

2. The Refine of Jalap.

Take of the roots of *Jalap*, the most weighty, black and shining, bruised grossly *℥ij*, of the spirits of Wine *℥iij*, let them digest being close shut and warm for two or three days: Let then the tinged Spirit, being poured forth into a Glass cucurbit, be taken away, the fourth part remaining, to which let it be instilled with cold water; the Refine will be precipitated to the bottom of the Vessel, which being washed from its filth and dried may be kept for use. The dose of its Powder is *gr. vj* to *xij* or *xiiij*.

The Refine of Jalap.

In this Preparation the spirit of Wine draws out the sulphureous Particles of that Concrete, and that the more easily, for as much as these in the mixtion were before separated of themselves and gathered together, as might be gathered from its resinous and bright shining Veins; whilst that the sulphureous part is drawn forth, some of the saline Stems also joyned with it: Wherefore this Refine stinking, and sharp in taste, purges strongly and becomes easily inflammable. This works in a lesser quantity, and stronger than in the whole mixture it self, for as much as all the active Particles, the blunt ones being done away, do grow together.

The reason of its preparation.

3. The Refine of Scammony.

Refine of Scammony.

This is prepared after the same manner as the Refine of Jalap, but in this Medicine, because that the saline Particles in the dissolving become more, nor are gathered altogether in the Refine with the sulphureous Particles, the operation is gentler and weaker than in its whole mixture: For although a great plenty of Sulphur be in the Scammony, yet its operation depends very much upon the saline Particles: Wherefore when that its Powder is fumigated by enflamed Sulphur, the purging force is much broken, because that the acid Salts emitted with the fume of that Concrete do enter into or fix the Saline Particles of another kind. The extracted Refines out of Turbith and Mechoacan, are gotten after the same manner of preparation, as from Jalap and Scammony.

4. The

Part I.

The extract of
black Hellebore.

4. The Extract of Black Hellebore.

Take of the Fibres of black Hellebore lbß, bruise them a while grossly in a stone Mortar, sprinkling them with the best spirit of Salt ʒiij: Afterwards being put into a Matrace, pour thereon of the smaller spirits of Wine, impregnated to a yellowness with salt of Tartar lbij, adding of *Lignum Aloes* and of Cloves bruised of each ʒij: Let them be digested, close shut and in warm sand three or four days, then filter the whole liquor, and let it be drawn off by a gentle warm Bath, to the consistency of an Extract. The Dose ʒj to ʒj.

This Medicine, because that the active and benign Particles being separated, both from the more dull and virulent, and further more fixed by the Salts of the *Menstruum*, and brought under; they are reduced by themselves into a Mass, operates more gently and in lesser abundance than the Powder of the Root: Moreover by reason of the adjoined Salts, which grow hot with the Salts of the *Viscera*, and humours of our Body, becomes the more efficacious.

So much concerning Medicines which direct their operations upon things laid up in the Ventricle almost altogether by plain and open ways, as it were the high Road, to wit, upwards or downwards, by the *Oesophagus* towards the Mouth, or by the Intestines towards the Arse. There remain many others, which either way treading the path to which they were destinated, do make known their actions upon the Blood, and System of Nerves with a various respect to the Heart, Brain, Reins, and other *Viscera*, or on the habit of the whole Body. Concerning which we will speak at length methodically, after that we shall have added some things concerning the Remedy of too much Purging, and especially for the *London Dysentery*.

C H A P III.

Concerning the Remedy of excessive Purging, or of Medicines stopping too great Purgation or Diarrhoea. Also concerning the London Dysentery, the knowledge or Theory of which, and the Method of Curing it is inquired into.

There is equally need of a Bridle as well as of Spurs no less about the right ordering of Purging than of Vomiting: For as sometimes Cathartick Medicines are of necessary use to make slippery the Belly, or to cause plentiful going to the Stool; so if that evacuation be immoderate, or shall not be easily tollerable, opposite Remedies or Antidotes of the *Diarrhoea* or Dysenterick Affection are to be prescribed. By what means and after what manner of affecting purgers do perform their operations, also for what causes besides, and occasions, spontaneous Purgings do frequently happen, is already shown. It shall be our present business in every of these cases, to wit, both in the medicamentall *Hypercatharsis* or excessive Purging, also in the *Diarrhoea* and dysenterick Affections to propose the means of curing them, together with select prescriptions or forms of Remedies.

The reason of the
Medicinal Hy-
percatharsis.

A purging Medicine being disproportionate either in quality or quantity, works more strongly and longer, and for as much as by irritating too much the nervous Fibres,

Fibres, the animal Spirits are agitated into exandescencies or agers not easily to be allayed, and for as much as it scatters the blood and the humours, and as it were melts them, therefore that their liquifications might be thrust down into the cavities of the *Viscera*, yet greater excretory irritations are made.

Part I.

The Therapeutick Method hath respect both to the precaution or prevention and curation of the *Hypercatharsis* or excessive Purging. As to the first there is need of consideration and caution before evacuation in its operation, and after its operation. For in the first place, it very much behoves to weigh both the constitution, strength, and custom of the Body to be purged; as also the nature, dose, manner of working, and ordinary effects of the Medicine to be given; then to proportionate by collected marks the vertue of the Agent according to the bearing of the patient. Secondly whilst that the Medicine operates, the *Viscera* of digestion, the Blood and animal Spirits should be kept free from any other perturbation. Wherefore in that time neither any gross aliments, nor viscous, nor many which may trouble the Belly, should be taken in; all External Cold whereby the Pores of the Body are shut up, should be carefully shunned; lastly the Mind should be pleasing, even and serene, and free from Cares, and more hard Studies. Thirdly the operation of the Medicine being finished, the Exandescency of the animal Spirits ought to be quieted, and the Effervescencie of the Blood and Humours to be appeased; for which end an anodine Medicine, or a gentle Hypnotick or causing rest is given according to the following Forms.

Its precaution.
1. Before Evacuation.

2. In its operation.

3. Afterwards.

Take of the Water of Cowslip Flowers $\mathfrak{z}\text{ij}$ of Barly Cinnamon water, Syrop of Poppies, of each $\mathfrak{z}\beta$, of Pearls $\mathfrak{D}\beta$, make a draught to be taken going to rest.

or
Take of Conserve of red Roses Vitriolate $\mathfrak{D}\text{ij}$, of Diacordium $\mathfrak{z}\beta$, of Pearls $\mathfrak{D}\beta$, of Diacordium what will suffice, make a *Bolus* to be taken going to sleep.

If that these things being omitted, or notwithstanding all this Caution, that an excessive purging by reason of the Medicine should happen, presently let the patient be put into a warm Bed and handled after this following Method. In the first place let there be applyed to the Ventricle and to the region of the whole *Epigastrium* or Belly, a plaister made out of the Treacle, or foment it with warm Linnen stoops dipped in the Decoction of Wormwood, Mints, with Spices and red Wine, and so wrung out: then let him take a Bole of Treacle Andromach. or it being dissolved in Cinnamon water. Moreover let him drink now and then a spoonful or two of burnt Wine with Mint water therein. If troubled with the wringing of the Gutts, let a Glister of warm Milk with Treacle dissolved therein, be given: and sometimes they ought to apply warm frictions to the exterior Members, and Ligatures, where by the Blood may be brought outward, and be detained from too great a Colliquation, and effusion into the Cavities of the *Viscera*: then in the evening, if that there be strength and that the Pulse appears robust enough, let a dose of *Diacodium*, or *Laudanum* in some fit Vehicle be taken.

The Cure of Excessive purging.

As to the other kinds of too much Purging, which, without a Cathartick being given are wont to arise from various Causes and occasions, they require a Medicine; I say for the most part they be merely Symptomatsicks of and depend upon other Diseases, and the Method of their cure is the same as of those Diseases themselves from whence they spring. So indeed in the Scorbute and Phthisick it is usual for the Diseased to be troubled with a frequent Flux of the Belly: the Method of curing doth not respect this Symptom, but the cause of the primarie sickness to be done away. But yet sometimes the Flux of the Belly (which is wont to be called the *Diarrhæa*, or *Dysenterie*) seems a disease of it self; and truly in this City of London, since this kind of Disease is wont to reign almost every Year, and is commonly esteemed peculiar to the place, this place will be very fit, to inquire a little further into its Nature, Causes, and method of curing it.

What is to be done in the Symptoms of the Diarrhoea.

Although the word *Dysenteria* in common acceptation denotes the bloody Flux of the Belly as well as the humoral Lask, yet saving the Etymologie, it is law-ful to apply this Name to the *London* Disease also when it is not bloody. For I have often, and for a long while, observed this kind of Flux, which is wont to infect us every Year about Autumn for the most part, commonly called the wringing of the Belly or (according to our Speech) the Gripping of the Gutts, to be of two far different kinds; in the one the Stools are watry, and as it were clear with a sudden failing of strength, but the other bloody, yet they are tollerable;

Two kinds of it viz. watry and in bloody.

Part I.

A description of
the former.

in the mean time bilous or phlegmatick Stools (whilst either of the diseases raged) very rarely happen, and denote the Disease to be not of so ill a condition. By which, both these Dysenterical Diseases are known clearly one from another, as to their Differences, Causes, and formal Reasons, it will be to the purpose to shew here Examples of either of these, observed then by me, and plainly described in those years when they were peculiar.

In the Year 1670 about the *Autumnal Equinox* very many laboured with the unbloody Dysenterie, but very cruel and very dangerous. The disease invading suddenly and frequently without any manifest occasion, did reduce those labouring with it, by great Vomiting, frequent and watry Stools, quickly to a very great debility, to horrid failure of the Spirits, and loss of all their strength. I knew some the day before well enough and very strong, in twelve hours space so miserably cast down by the Tyranny of this Disease, that with a weak and small Pulse, cold Sweat, short and quick Breath, they seemed just ready to dye: and truly not a few to whom fit Remedies or opportunity of cure were wanting, were suddenly killed by it. This sickness raging for a whole month began to decrease about the middle of *October*, and before the beginning of *November* was almost wholly vanished. Very few in that time had bloody stools, and not many Bilous but very many had Vomits, and watry, almost clear and plentiful Stools, whilst that popular Dysenterie raged so cruelly in the City, in the Country or at least three miles beyond the City, almost none was sick of it. Besides here, although very many were sick, the disease did not seem to be propagated by Contagion, but to affect those only that were predisposed. For it did not take those who were conversant in the same Family with the sick any sooner, than those who shun'd their Houses.

Its Cure.

For the Cure of this Disease no Evacuation did help, yea Phlebotomie, Vomiting, and purging sometimes did hurt; but for the most part, the remedies were only Cordials, and those the most hot, to wit, abounding in Spirits, and Sulphur or volatile Salt, that were beneficial; insomuch as the Spirits of Wine with Sugar a little burnt became as it were the epidemical popular remedy, and in such a Dysenterie for the most part profitable, although in the other bloody Flux, indifferently used, oftentimes was found hurtful. The method of curing which I happily administred to very many then, and also am wont still in the like Case, was according to the following manner.

Bole.

Take of Treacle Andromach. 3j, or 3ij, in your Bed drink after it of the following Julep 7 or 8 Spoonfuls, and repeat it every third, fourth or fifth hour.

Juleps

Take of Mint water, Cinnamon barly Water, of each 3ij. of strong Cinnamon Water, Treacle Water, Plague Water: of each 3ij, Powder of Pearls 3j of Crystals of Sugar 3ß, mingle them and make a Julep: at the same time let there be applyed warm to the Ventricle a little piece of Bread toasted and done over with Treacle dipped in warm water or red Wine, and by and by changed.

Opiates.

In the Evening if the Pulse and breathing shall be strong enough give him to drink in a little draught of Plague Water, of liquid *Laudanum* prepared with Juice of Quinces, gr. xx.

Take of the *Diafcoridium* 3j, of liquid *Laudanum* ʒß, Powder of Crabs Claws Compounded ʒj, of Cinnamon Water what will suffice: make a Bole to be taken going to sleep.

To such as Treacle and Mithridate are nauseous or not agreeable, let there be given a dose of the following Powder or of the Spirit of Treacle every third hour with the Julep.

Take of the Powder of Crabs Claws compound, of the Roots of *Contrayerva*, of *Serpentaria Virgin.* of each 3j, of Cinnamon, of Tormentile Roots, of each 3ß, of Saffron, of Cochineel of each ʒj, make a Powder: the Dose is 3ß to ʒij.

Spirits.

Take of the Spirit of Treacle prepared with Armoniac. 3ij. the Dose is ʒj, with the Julep every fourth hour. After the same manner the Spirits of Harts Horn, or of Soot may be given. Let his drink be Ale boyled with a Crust of Bread, Mace, and Cinnamon, and sweetened, or burnt Wine diluted with Mint Water. Let his food be Broth of a Pullet, or Gruel, or Panada with the shavings of Harts Horn, Ivory, Scorzonera Roots &c. boyled in it.

The reason of
this Disease.

Let us enquire now concerning the reason of this particular Disease, what is its chief conjunct Cause, to wit, what kind of peccant Humour that is to be purged

ed out, that should so infest the *Viscera*, and should irritate them into excretory Convulsions with torments, Perturbation of the whole Body, and sudden failure of all their strength. Certainly none will think this, Choler, or pancreatick Juice, or what else you will to be begotten within the intestinal Pipes: neither do we believe it indeed from the meer Blood, (as sometimes happens in the *Crisis* of Fevours poured forth into the *Viscera*. But rather we suspect (as by the sudden Languor and soon falling down of the Spirits, and enervation of all the parts it will be lawful to conjecture) in this disease the more noble Juices of the Body, to wit, the nervous and nutritious placed in the solid parts to be wholly vitiated from their natural Complexion; and dissolved and spread abroad as it were a stream, and to overflow into the bloody Mass; then presently from it (they being indeed incongruous and immiscible, and unapt to be sent away by urine or by transpiration) to be transferred towards the Stomach, and Intestines by the Celiac Vessels, and there flowing forth from the thick planted little mouths of the Arteries, to stir up these horrid dysenterical Symptoms. Further it seems that together the Blood it self being scattered abroad by the flood of the other humours, is melted with them, and being loosened in its complexion, its meltings do burst forth with the other excrements into the Cavities of the *Viscera*.

Part I.

Certainly all the moving Fibres with the fainting away of the whole Soul on a sudden can proceed from no other Cause, but that the humour actuating them, and in which the animal Spirits dwell, leaving them wholly, doth flow forth; and indeed we suppose it to flow forth, for as much as it being vitiated in its complexion, and growing sower like milk doth molest the containing Parts, and irritate them into wrinkles whereby it may be shaken off. Besides we take notice that this Disease always or for the most part began with Cold, to which nevertheless heat and a feavourish burning did not succeed, because the Blood, although but little vitiated in it self, nevertheless being wholly overturned by the flood of another invading juice, could not emerge or recollect it self, that it might grow feverishly hot as in the *Crisis*. Hence it was that Cordials, except very strong and hot, as hot waters and Spirits, Treacle, Mithridate and the like, did not help, whose highly active Particles, whilst they easily entered into the mouths of the splanchnical Vessels did repel the out flowing humours, and further insinuating themselves by degrees into the bloody Mass, they did invigorate it, and stir it up into fermentation, and into the motion of evaporation; whereby it might be able to recover its former disposition, and to cast back into the habit of the Body whatsoever incongruous thing had entered into it.

It arises chiefly from the vitiousness of the nervous Liquor.

So much for the conjunct or next cause of this Disease, the more remote are preceding or antecedent, and manifest or evident; those denote from what occasion or provision this kind of morbid and epidemical *Diathefis* or disposition proceeds; and these for what occasions it rather breaks forth into a dysenterick Affection. As to the former, that this disease rages more frequently in Autumn, it is ascribed by many, to the immoderate or rather autumnal eating of the Summer Fruits; which indeed we should easily admit to be a part of the cause of the bloody Flux, and also so we may deservedly suspect the aforesaid disease to have some certain rise from thence. But truly this cause of the Disease does not appear to be from hence true and equal, because that many inhabitants of this City abstaining from fruit, or using them sparingly, every where laboured with this unbloody Flux whilst it was general; and others who are fruit eaters in the neighbouring Villages altogether free from it were affected with other Fevours without any gripings of the Belly or Flux. For truly I have often observed (which also hapned this Year) after an exceeding hot and dry Summer, in the Autumn Epidemick and irregular Fevours to have hapned in many places of *England*, and at the same time very few Londoners to have fallen sick of that Feavour, but very many of the dysenterick Disease: the reason of which seems to be, that when our Bodies by reason of the foregoing Intemperateness of the Summer, are disposed to autumnal Fevours, they are rather determined, in this thick and smoaky Air into this kind of Disease. Because that transpiration being hindered, the corruptions of the degenerate humours, being unable to be carried forth thorow the Pores of the skin, overflow within, and there bursting forth from all the Arteries together, they cause these horrid affections of the *Viscera*.

Its more remote Causes.

Therefore Antumnal and Epidemical.

Its antecedent Causes are 1. The thickness of the London Air.

Further, the summer season, according as it is more or less, hot or cold and moist, &c.

2. The intemperateness of the Year.

Part I.

moist, or dry, makes great alteration in the humours of our Bodies, and even also in some fermentative juices; and perverts them oftentimes from their genuine Complexion into a bitter, or sharp, or adust Nature. Besides in some years this mutation is impressed chiefly on the Blood, and in others rather upon the nervous Liquor. By reason of the former, for the most part autumnal or sharp continual, or cruel intermitting Fevours do follow; in respect of the other irregular Fevours, and if an ill condition do arise; in which without any great incalescency of the Blood, or *crisis* of the Disease, very dangerous affections of the Brain and nervous stock do happen. Moreover in these kinds of affections, either the excrements of the nervous liquor growing degenerate by degrees, being of a slow motion, leasurely and by little and little heaped up without any critick turgescency, and remaining a long while within the containing parts, bring forth nervous Fevours, with nummels and cold; (such as we have described in our *Spasmologie*) or else the corruptions of that juice very much, and suddenly changed in its complexion, are carried forth more, and growing active do arise up with certain overflowings, and flow back on all sides into the mass of Blood, from the Fibres, and from the Nerves, and from the solid Parts, and from thence presently running over into the cavities of the *Viscera*, produce this sort of unbloody Flux which we have now described; and hence it further appears that this watry flux of the Belly arises rather from the depravation and colliquation of the nervous and nutritious juice, than of the blood it self, by reason of the sudden and great dejections of the spirits (which such an effusion of the mere blood could not bring forth) because that those labouring with this Disease, are not troubled with the heat or ardor of the juices, or scabritiousness of the Tongue, but do very well bear the hottest Medicines; and as soon as an inversion of the peccant humour and a retorsion of it into the habit of the Body, by these things taken, is procured, they easily grow well without a feavour, watchings and other consequences of corrupted Blood.

Insident Causes.

We have not much to say of the evident causes of this Disease, when there is such a constitution of the year, that by reason of the evil influence of the air or Heaven, the juices procreated from the blood, to wit, the nervous and nutritious do degenerate from their due temperament or *crasis* into a strange infectious Nature, and as it seems sower, and for that cause dysenterick. Errors in living at that time permitted, with other non-naturals do cherish, increase, and sooner bring on this sort of depraved disposition into an Eccathartick turgescency: it will not be worth our while here particularly to explicate all the manifest causes and occasions, by which they are made, but rather let us pass them over, to exhibit the knowledge of the other, to wit, bloody dysentery.

Of the bloody Dysentery.

An Example of it described.

A winter exeteanly cold, such as scarce any one living had known, followed the Autumn of the Year, 1670: noted for the unbloody Flux but now described: the following Summer had no less a share of the other extream, to wit, most hot and dry, after this upon the approaching Equinox an epidemical Feavour arose which raged almost thorow all *England*. This, keeping the form of an intermitting Feavour, had Paroxysms or fits now every day, now every third day, with none or but very little cold only, but with a very strong heat, which, for many hours, and not seldom protracted beyond the space of a night and a day, hardly passed into sweat, and that but partial, and often interrupted, no feavourish heat succeeding. The sick were presently affected with an unwonted *Languor*, watching, *Vertigo*, and frequently with a cruel Headache; and the disease rarely or never to be judged by a perfect *Crisis* did sorely vex for a long while, or fixing an incurable evil to the breast did end in a stupifying, or Pthical, and oftentimes deadly affection. We have formerly in our *Pyretologie* described a Feavour like to this, together with the Theory and method of curing it, the like constitution of the year preceding it.

An irregular Feavour was wont to be contemporary to this in other places of England.

Whilst that this Feavour, in the Country did wander up and down almost everywhere thorow the villages and Towns, at *London* a Dysentery truly bloody as one may say, both full of blood and cruel, greatly raging did precipitate very many in-

to the grave. From the first invasion of this Disease, Blood copiously and often was cast forth, and for the most part with grief, and pains of the belly; pertinacious watchings with a fevour, and huge thirst were wont to trouble them, notwithstanding their strength remained indifferently, so as the diseased, after being about a week sick, and going almost twenty times a day to stool were able to rise out of their Beds. These bloody stools although they seemed terrible, yet the sick did not quickly die, but did persist many weeks, yea sometimes months daily voyding blood, and in a great abundance; and at length, if the disease growing worse and worse did tend towards an ill end, before death, other symptoms, and chiefly wakings, a scurf of the mouth and Tongue, thirst and sometimes deadly ulcerations did appear, yea these symptoms breaking forth sooner than the unruly flux; and sooner than its due restraint did shew a great danger of death. The poor by the ill means of living, of a long time before used, also those whose cure was pretermitted, or unluckily administred, did frequently die; on the contrary those indued with a better state of body, and trusting to fit and timely medicines very often escaped. Moreover the disease it self, though epidemical, yet was not alike malignant in all, but seemed gentler in some, and crueller in others viz. the Flux of the Belly was in the beginning sometimes gentle and not unlike a *Diarrhœa*, of which, although their stools were frequent, yet without pain or much blood, they were easily and sometimes quickly cured, sometimes this disease appeared exceeding rigorous and horrid, to wit, in which Blood was poured forth in abundance and with mighty torments, and most sharp anguish. But in some more liquid, and stained with diluted blood, as it were the washing of flesh, in others more thick and deep dyed with thick blood, and waxing white with muck, and also sometimes stufed with gobbets of membranes. The seat of the grief was now higher, now lower, in these the small Guts, in those the thick Intestines, shewed to be more affected.

The method of curing it, with the Remedies, which I found to bring help to many, was according to this following manner. In the first place for the stopping *The method of curing it.* a little, or moderating the Flux.

Take of Treacle *Andromach* ʒj, of liquid *Laudanum* Cydoniat. gr. xx: make a Bole to be taken going to rest.

Take of Conserve of red Roses vitriolated ʒj, of Treacle *Androm.* ʒj, the powder of Tormentil Roots, *Contrayerva*, Pearl, Coral broken, of each ʒj, fyrupe of dried Roses what will suffice; make an Electuary to be taken every fourth or fifth hour. the quantity of a Chestnut, drinking after it of the following Julep ʒiij. *Electuary.*

Take of Mint water, of Baulm water with Cinamon of each ʒiij, of Treacle and plague water of each ʒij, of pearl ʒj, of sugar ʒj, mingle them and make a Julep. *Julep.*

After a day or two let there be administred a purging and astringent potion. *A gentle Purge.*

Take of sliced Rhubarb ʒij, of the yellow mirobalans sliced ʒijβ, red sanders, Cinamon of each ʒj, let an infusion be made all night in Plantane water, Cinamon, barley water of each ʒijβ, let it be strongly wrung forth, to which add of strong Cinamon water ʒijβ, make a draught.

I was wont every evening, and in some cases in the day time, to give a good dose of *Laudanum*, neither have I ever known this medicine to have been hurtful to any dysenterick person, either that the Narcotick force of the medicine might be overcome by the more acid juice of the Ventricle, and as it were made tame, or rather, that its Particles transmitted to the blood, were again from thence quickly cast forth with the bloody stools, whereby they did less affect the Brain. *Opiates.*

To whom the above Confection shall be either nauseous or less fit or agreeable, this following Powder may be given in its place.

Take of the powder of red Cloth ʒj, of the roots of *Contrayerva* ʒβ, make a powder, divide it into 3 parts, take it in what liquor you please, or *A Powder.*

Take of Bole Armenack, Alexiterion (that is impregnated with the juices of the leaves of Tormentil, Bistort, red Roses &c. and dried in the sun) of the Roots of *Contrayerva* of each ʒj, of Pearl, of red Coral, of the whitest Amber of each ʒβ, make a powder, the dose is ʒij, to ʒj.

Take of Roots of Clove-gilliflowers, *Scorzonera* of each ʒj, of Tormentil, Bistort, *Contrayerva* of each ʒijβ, of Harts horn burnt ʒiij, of the shavings of Ivory and of Harts horn each ʒij, Coccinel ʒβ, red rose buds ʒij, let them be boyled *Apozem.*

Part 1.

boyled in as much spring water as will suffice to ff ij, towards the end add of Conserve of red Roses ʒiij, to the clarified Colature add of plague water ʒiiij, the dose is ʒiiij.

For the quieting the torments of the Intestines, and healing their gnawings glisters are wont to be often used.

Take of the tops of St. John wort, with sheeps feet or chaudern ʒviii, or xij, of Treacle *Androm.* ʒij, oyl of *Hypericum* ʒiʒ, make a Glister.

I omit here many other forms of Medicines, which are every where extant in Books of the practice of Physick, and which every one may prescribe, as he ought according as the thing shall require. It now remains that we inquire a little into the Aetiology of this Epidemick or rather peculiar Disease.

Shewing the reason of this disease.

It appears plain enough, by what hath been said, that as the unbloody dysentery doth not, so neither doth the bloody flux proceed from the mere more sharp contents of the Intestine. Further as that other disease seems to have had its original from the flood of the degenerate nervous Liquor, and nervous juice; so this chiefly from the corruption and vice of the Blood; and therefore even as of that, a nervous sickness in another place was contemporary with the peculiar evil of this place, so when the bloody dysentery afflicted the Londoners, an intermitting tertian Feavour (as it is described by the Physicians) infested in like manner the rest of *England*. And indeed, tis plain to be conceived that, when as the blood being roasted with the Summer heats, therefore would be apt about Autumn for immoderate feavourish effervescencies, and like wines made warm, for fermentations whereby they might be purged, if it cannot send away its degenerate and to be purged Particles by reason of the perspiration being hindred in the more thick Air, the ordinary way by evaporation, for that it is yet hot, it transfers them towards the Intestines, and indeavours to cast them out there by the more open mouths of the thick set Arteries. But indeed the incongruous excrements of the degenerate Blood, or the *Morbosum inquinamentum* being more thorowly boyled into it, and intimately confused, not easily to be extricated or sifted forth, wherefore it being big and burthened with this loading, whilst in its circulating it passes thorow the smaller vessels, it becomes very much straitned, and therefore, about the internal superficies of the Intestines where the Coats of the Arteries are thinner, the blood there swelling up, together by reason of the heterogeneous Particles with which it is full, being made thick and apt to coagulate, it easily breaks forth; and when it cannot sift out and put off its Excrements alone; pours forth with them greatly infestous and portions of it self.

Three things concur to the constituting this disease.

Therefore for the exciting this popular dysentery, these three things must concur: viz. there must be a dyscrasy or evil disposition of the sanguineous Mass, arisen thorow the intemperateness of the year whereby it is very prone to fall into feavourish effervescencies, of its own accord or occasionally. Wherefore whilst this Disease is wont to rage at *London*, an irregular Feavour did the like in most other places. Secondly the Excrements and corruptions of the so boyling blood and degenerate in its complexion, are so confounded, and intimately boyled into it, that they cannot neither be easily sifted forth, nor suddenly cast out either by sweat or urine. Wherefore we have observed the Feavour contemporary and even continual with this dysentery to have been most difficult to pass judgement on, and its Paroxysms scarce ever to have ended in a feavourish distemper. Thirdly, a constipation of the Pores is to be added to these (which determinate the aforesaid dispositions into the bloody Flux) being caused by a smoaky, thick constitution of the Air: For this directs the effervescency of the Blood toward the Intestines, where when its Filth or excrements cannot be sifted forth, and not easily separate from the remaining Mass of Liquor, the Blood spontaneously flows forth it self, in highly infected portions, and therefore apt to run.

This Disease is either gentle or malignant.

By reason of this kind of Provision the ordinary *London* dysentery, and not very malignant, is wont to arise; which, although in respect of its bloody stools it becomes presently horrid, and for the most part of long continuance, yet it is not very contagious or more often deadly. But moreover this Disease sometimes virulent and as it were pestilential, kills many, and largely shews its miasm or defilement by contagion. Further, in such a condition the portions of the Blood, being touched with a certain malignity begin to be broken as in the pest, and which ought to be sifted forth and cast out, from the remaining Mass, lest the whole be presently over-

overpowred; which indeed being more thick and therefore apt to be purged forth rather by the Belly than by the habit of the Body or by Urine, they are carried into the Coats of the Intestines by the Pipe of the Mesenterick and Cæliack Artery; where when they cannot easily go away from the remaining Blood, breaking forth partly from the Vessels, they cause bloody stools, and partly being fixed in the membrane of the Intestines they bring forth in them a Phlegmon or inflammation of the blood or ulcerous disposition, and sometimes also a sphacelous or mortified ulceration, and quickly killing.

So much for the bloody dysentery such as uses to be the peculiar Disease of this place about Autumn, with the Causes both conjunct and antecedent: as to what respects the manifest causes or occasions which bring into act the morbus disposition: First there ought to be referred hither the ill means of living, and the pravity of the inspired Air, wherefore it is familiar in every region, by reason of Filthiness and vitious aliments in the Camps of Soldiers and in the prisons of Captives; besides many other errors in the non Naturals may belong to this Cause, concerning which we shall neither have leisure, nor will it be worth our pains here more particularly to discourse.

The Therapeutick Indications into which the method of curing or the *Praxis* above represented may be resolved, are chiefly or primarily four, to wit, two in respect of the Blood, and as many in respect of the *Viscera*. In the first place as to the Blood, it behoveth to drive forward both Excrements and corruptions budding within, outwardly towards the habit of the Body, then to dissolve its Coagulations, and to restore its complexion as much and as soon as may be: The first of these is performed by Diaphoreticks, and the other by proper *Alexipharmicks* or Preservatives. Secondly as to what has respect to the *Viscera*, the troublesome sense of the nervous Fibres, and the stirring up of the fleshy to Excretory convulsions ought to be appeased, and the mouths of the Vessels, lest they power forth the blood and humour into the intestinal Pipes, ought to be shut up. The first of these Opiates, and the other Styptick or binding remedies use to affect: Besides these it is behoveful to heal the greatly urging Symptoms and evil Affections that are wont to happen to this disease, the chief of which are a Feavour, with Thirst, and wakings, torments of the Intestines, and sometimes gnawing, inflammation and ulcers of them.

Curative Indications.

Two in respect of the Blood.

Two also in respect of the Viscera.

I shall not insist upon these primary Indications singly and successively, but I shall contract them together, and speak of them at once. Wherefore the Forms of the Medicines ought to comprehend Remedies of divers kinds, to wit, Alexiterick or preservative, Styptick or binding, Diaphoretick or evaporating & Opiatick or causing sleep or stupifying. Because it will not be easy to reduce these into a certain method, and Rules which may be convenient for many, therefore I have rather chose to lay before you now examples of Cures of the Dysentery done in the Autumn of the year 1671, when this Disease cruelly raged.

An illustrious young Man about 25 years of Age, of a sanguine Complexion and of a former healthful Constitution, about the beginning of October without any manifest cause, fell into a Dysentery; and although presently from the first day the stools were plentiful and bloody with pains, yet being strong, and his strength continuing, he forbore taking Physick till the third day, at which time being sent for late at night I prescribed this following *Bolus*.

The first History.

Take of Treacle Andromach. ʒj, liquid *Laudanum* Cydoniat. ʒj, mingle them drinking after it a little draught of the following Julep.

Take of the water of Tormentile mints, and cinamon barley water of each ʒiiij, of Treacle, and Plague water of each ʒij, of Pearl ʒj, of Sugar ʒj, make a Julep. Besides he took every third hour of the following Electuary about ʒjʒ, with the same Julep.

By these Remedies the fierceness of the disease was soon lessened, that in the space of 24 hours he had scarce above 6 or 7 stools, which also were not so bloody as the former, but appeared full of little bits of flesh, and membranes, which without doubt were some certain gnawn off Portions of the jaggy or hairy Coat: he took every evening Opiates with *Laudanum*.

On the fifth day of his sickness he took this following draught.

Take of sliced Rhubarb ʒij, Citrons, Myrabolans ʒjʒ: yellow Sanders ʒʒ powder of Cinamon ʒj, salt of Wormwood ʒʒ, make an infusion all night in plantane and cinamon

A. Purge.

Part 1.

Cinamon barly water of each $\mathfrak{z}\text{ij}\beta$, add to it being strained of strong Cinamon water $\mathfrak{z}\text{ij}$.

It purged him 3 or 4 times and gave him ease, and the next day, he was better his feavour being abated, so that seeming to grow well he eat flesh; but he then presently relapsed, so that the Dysentery returning with the Feavour; it was more cruel that at the beginning: then because the former medicines began to grow nau-
seous, I prescribed after the following manner.

A Powder.

Take of the powder of Tormentil Roots, *Contrayerva*, of Bolus Alexiterion: of each $\mathfrak{z}\text{j}$, of Pearls, of red Coral broken, white Amber of each $\mathfrak{z}\beta$, make a powder, the dose is $\mathfrak{z}\beta$, in distilled water $\mathfrak{z}\text{ij}$.

Distilled water.

Take of the tops of Cyprus, Mirtle of each iiij handfuls, of the leaves of Meadowsweet, Pimpernel, *St. John* wort and Clovegilliflowers of each ij M: of the roots of Tormentil & Bistort $\mathfrak{z}\text{vj}$, red Rose flowers iiij M: of the Berries or grains of Kermes $\mathfrak{z}\text{iiij}$, of Cinamon and Mace each $\mathfrak{z}\text{j}$, let them be sliced and bruised altogether and put into red Florence Wine and red rose water of each iiij lb, let them be distilled in an ordinary still, let the whole liquor be mingled, and when it is taken sweetened with Syrup of Coral. Also he took of the following decoction $\mathfrak{z}\text{ij}$, or iiij , three or four times a day.

Apozem.

Take of the Roots of Avens or herb Bennet of *Scorzonera*, of each $\mathfrak{z}\text{j}$, of Tormentil $\mathfrak{z}\text{ij}$, of Harts Horn burnt and powdered $\mathfrak{z}\text{vj}$, of the shavings of Ivory and of Harts Horn, of each $\mathfrak{z}\text{ij}$, the tops of *Hypericum* Mj, of red Roses and Pomegranate flowers of eage 1. P, let them be boyled in lb ij , of spring Water till it comes to lb ij , adding thereto towards the end, of red Lisbon Wine $\mathfrak{z}\text{ij}$, Conserves of red Roses $\mathfrak{z}\text{iiij}$: let them be kept hot, close shut for an hour and then strained through an *Hypocrates* sleeve.

Every Night he took of liquid *Laudanum* $\mathfrak{z}\text{j}$, in the Dysentrick Water, just now described with Syrup of Clove Julyflowers $\mathfrak{z}\text{ij}$.

A decoction for the ordinary drink.

For the ordinary drink make a decoction of Harts Horn burnt, with Barly, a crust of Bread, Mace, Cinnamon, to a Pint and an half of which add a Pint of new Milk.

He took the purging Infusion again, by the use of which and former things, within 10 Days his feavour leaving him the Dysenterie became much gentler, which though it were without pains or much Blood, yet it continued still with Caruncles, Gobbets of the Membranes, and bloody Phlegm or Gelly, in his excrements. Therefore for corroborating and healing the Intestines, these following things were administred.

A Clyster.

Take of the tops of the Cypress Tree, of the leaves of Periwinkle, and of Mouse-ear each Mj, Red-Rose Flowers pug. ij : Let them be boyled in broth made of a Sheeps Gathers, of the liquor strained lbj, add to it of the Oyl of *St. John's* Wort $\mathfrak{z}\text{ij}$, honey of Roses $\mathfrak{z}\text{i}\beta$, mingle them for two Clysters, one of which he took in the morning, and the other at five a Clock in the afternoon. A Plaister of red Lead and *Paracelsus*, was laid upon his Belly: he took besides twice a day of the juice of Plantain with water of *Scordium* or Germander, and Plague water $\mathfrak{z}\text{ij}$; also he eat every day a Quince roasted in the Ashes, being made hollow and filled with the Powder of *Olibanum*, Mastick, and Tolutan Balsom.

A Plaister.

By the constant use of these Remedies, he grew perfectly well within a Month.

The second History.

About the same time another strong young man fell into a terrible Dysentery: From the first day presently frequent Stools, and very bloody with pain and gripings brake forth, besides a strong Fever with cruel vomiting, thirst and wakings molested him. When these Symptomes were a little mitigated by opiates which he took, by and by he was affected with a *Delirium* and *Vertigo*, with an intermitting Pulse and horrible shakings, for as much as the malignant matter being restrained within did forthwith flow back upon the Brain and Nerves, which nevertheless presently was allayed, as often as the flux of the Belly and Vomiting returned. On the fifth day Vomiting forth bloody matter, he complained of a great pain and grief as if it were ulcerous in his stomach, that I did indeed suspect there had been there a Phlegmon or Ulcer, as uses to begin about the Intestines, but by emolliating Broths and Milk diet administred; his Vomiting and pains of his Stomach soon ceased, but in the mean time the flux of his Belly increased. He took that night of *Diacodium* $\mathfrak{z}\text{j}$, with Cowslip water and Cinamon water of each $\mathfrak{z}\text{i}\beta$,

by

by which remedy he was so much eased, that in a night and a days space, he remained without vomiting or pains, and with a few Stools only, with a laudable pulse with often and moderate slumbering : But in the following night, although the same Opiates were repeated, a very frequent flux of the Belly, and bloody, returned. The next day he took an infusion of Rhubarb with *Mirabolans*, red Sanders and Cinamon, he voided usually bilious, highly sharp and generally bloody Stools; then in the Evening he took of liquid *Laudanum Cydoniat.* drops xxv, in a spoonful of Cinamon Barly water, he had moderate and pleasing sleeps. Afterwards abhorring any more Medicines, he took only an Opiate every evening, now this, now that, and in a short time he grew well.

Part I.

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Sect.

Part I.

Cinamon barley water of each $\mathfrak{z}\text{ij}\beta$, add to it being strained of strong Cinamon water $\mathfrak{z}\text{ij}$.

It purged him 3 or 4 times and gave him ease, and the next day, he was better his feavour being abated, so that seeming to grow well he eat flesh; but he then presently relapsed, so that the Dysentery returning with the Feavour; it was more cruel that at the beginning: then because the former medicines began to grow nau-seous, I prescribed after the following manner.

A Powder.

Take of the powder of Tormentil Roots, *Contrayerva*, of Bolus Alexiterion: of each $\mathfrak{z}\text{j}$, of Pearls, of red Coral broken, white Amber of each $\mathfrak{z}\beta$, make a powder, the dose is $\mathfrak{z}\beta$, in distilled water $\mathfrak{z}\text{ijj}$.

Distilled water.

Take of the tops of Cyprus, Mirtle of each iiij handfuls, of the leaves of Meadowsweet, Pimpernel, *St. John* wort and Clovegilliflowers of each ij M: of the roots of Tormentil & Bistort $\mathfrak{z}\text{vj}$, red Rose flowers iiij M: of the Berries or grains of Kermes $\mathfrak{z}\text{iiij}$, of Cinamon and Mace each $\mathfrak{z}\text{j}$, let them be sliced and bruised altogether and put into red *Florence* Wine and red rose water of each iiij fb , let them be distilled in an ordinary still, let the whole liquor be mingled, and when it is taken sweetened with Syrup of Coral. Also he took of the following decoction $\mathfrak{z}\text{ij}$, or iiij , three or four times a day.

Apozem.

Take of the Roots of Avens or herb Bennet of *Scorzonera*, of each $\mathfrak{z}\text{j}$, of Tormentil $\mathfrak{z}\text{ij}$, of Harts Horn burnt and powdered $\mathfrak{z}\text{vj}$, of the shavings of Ivory and of Harts Horn, of each $\mathfrak{z}\text{ij}$, the tops of *Hypericum* Mj , of red Roses and Pomegranate flowers of eage 1. P, let them be boyled in fb ij , of spring Water till it comes to fb ij , adding thereto towards the end, of red *Lisbon* Wine $\mathfrak{z}\text{ijj}$, Conserves of red Roses $\mathfrak{z}\text{iiij}$: let them be kept hot, close shut for an hour and then strained through an *Hypocrates* sieve.

Every Night he took of liquid *Landanum* \mathfrak{Dj} , in the Dysentrick Water, just now described with Syrup of Clove Julyflowers $\mathfrak{z}\text{ijj}$.

A decoction for the ordinary drink.

For the ordinary drink make a decoction of Harts Horn burnt, with Barly, a crust of Bread, Mace, Cinnamon, to a Pint and an half of which add a Pint of new Milk.

He took the purging Infusion again, by the use of which and former things, within 10 Days his feavour leaving him the Dysenterie became much gentler, which though it were without pains or much Blood, yet it continued still with Caruncles, Gobbets of the Membranes, and bloody Phlegm or Gelly, in his excrements. Therefore for corroborating and healing the Intestines, these following things were administred.

A Clyster.

Take of the tops of the Cypress Tree, of the leaves of Periwinkle, and of Mouse-ear each Mj , Red-Rose Flowers pug. ij : Let them be boyled in broth made of a Sheeps Gathers, of the liquor strained fbj , add to it of the Oyl of *St. John's* Wort $\mathfrak{z}\text{ij}$, honey of Roses $\mathfrak{z}\text{ij}\beta$, mingle them for two Clysters, one of which he took in the morning, and the other at five a Clock in the afternoon. A Plaister of red Lead and *Paracelsus*, was laid upon his Belly: he took besides twice a day of the juice of Plantain with water of *Scordium* or Germander, and Plague water $\mathfrak{z}\text{ijj}$; also he eat every day a Quince roasted in the Ashes, being made hollow and filled with the Powder of *Olibanum*, Mastick, and Tolutan Balsom.

A Plaister.

By the constant use of these Remedies, he grew perfectly well within a Month.

The second History.

About the same time another strong young man fell into a terrible Dysentery: From the first day presently frequent Stools, and very bloody with pain and gripings brake forth, besides a strong Fever with cruel vomiting, thirst and wakings molested him. When these Symptomes were a little mitigated by opiates which he took, by and by he was affected with a *Delirium* and *Vertigo*, with an intermitting Pulse and horrible shakings, for as much as the malignant matter being restrained within did forthwith flow back upon the Brain and Nerves, which nevertheless presently was allayed, as often as the flux of the Belly and Vomiting returned. On the fifth day Vomiting forth bloody matter, he complained of a great pain and grief as if it were ulcerous in his stomach, that I did indeed suspect there had been there a Phlegmon or Ulcer, as uses to begin about the Intestines, but by emolliating Broths and Milk diet administred; his Vomiting and pains of his Stomach soon ceased, but in the mean time the flux of his Belly increased. He took that night of *Diacodium* $\mathfrak{z}\text{j}$, with Cowslip water and Cinamon water of each $\mathfrak{z}\text{ij}\beta$,
by

by which remedy he was so much eased, that in a night and a days space, he remained without vomiting or pains, and with a few Stools only, with a laudable pulse with often and moderate slumbering : But in the following night, although the same Opiates were repeated, a very frequent flux of the Belly, and bloody, returned. The next day he took an infusion of Rhubarb with *Mirabolans*, red Sanders and Cinamon, he voided usually bilious, highly sharp and generally bloody Stools; then in the Evening he took of liquid *Laudanum Cydoniat.* drops xxv, in a spoonful of Cinamon Barly water, he had moderate and pleasing sleeps. Afterwards abhorring any more Medicines, he took only an Opiate every evening, now this, now that, and in a short time he grew well.

Part I.

K

Sect.

Part I.

SECT. IV.

CHAP. I.

Of the Diuresis or Evacuation by Urine, and of Diuretick Medicines.

The near kin of
the Diuresis and
the Diaphore-
sis with one a-
nother.

WE have some time since largely enough set forth the Original of the Urine, and its composition whilst it was either a part or an excrement of the Blood, its Offices and manner of Separation. But we shall here further note, that this hath a certain affinity with sweat, that, and not seldom, they change their courses, and the matter of the one is conveyed forth adooors by the emunctories of the other: For that the cutaneous Emanations if they are strong and impetuous; snatch along with them much of the ferous liquor destined for the Reins, and transfer it into sweat: Also on the other side, when by a copious afflux the *serum* is cast forth by the Reins, it brings inwardly very many little bodies that are wont to exhale by the Skin, and involving them in its torrent, sends them away by the urinary passages. Hence it comes to pass, that Diaphoretick and Diuretick Medicines, are of a very near alike use, and sometimes reciprocal: By either of them being taken, the mass of the Blood is scattered abroad or precipitated, at least it is compelled to separate into parts, for that the *serum* drawn away from the rest of the Blood, may be driven forth adooors by the more easie way which shall be granted.

What the matter
of the urine is,
and from whence
it comes.

It is threefold.

Although the immediate matter of the Urine flows only from the Blood, and is carried by the only passage of the emulging Arteries to the Ureters, yet oftentimes mediately that is wont to have manifold springs, and indeed divers, which for the most part may be distinguished by a threefold consideration, viz. It is stale or mere excrement, and is the watry part of the Blood growing stale, which being circulated with it for some time, acquires from the incocted saline and sulphureous Particles a lixivial Tincture. Or Secondly, it is that *Dilutum* or steeped Liquor, of the yet crude Chyle, which indeed is poured abroad or suffused in great abundance with the Blood, and being separated again from it before it is dyed with the Tincture, causes an Urine plainly limpid, or clear. Thirdly and lastly, the matter of the Urine oftentimes is a certain water, for the most part suffused or poured abroad from the Blood, or as it were distilled into the solid parts, glandula's and Pipes of the *Lympha* or water carriers, which being plentifully laid up together, and then of its own accord or some occasion being given gathering together a Flood, and dropping forth from its receptacles by the lymphæducts, it is carried back into the veins; from whence by a swift passage, passing through the Blood untouched; it is thrust down by the Arteries into the Reins; and for that the Particles of Salt and Sulphur are not incocted or boyled into this, by reason of its short stay in the Blood, from thence a Urine also limpid or clear is produced. The Urine of men in health, for the most part does participate after a sort of each of these, and according as the matter exceeds in this or that together, the Urine appears more or less or not at all tinged. The *serum* coming from every part, and being mixed with the Blood, is separated again from it in the circulation in divers places but chiefly in the Reins: For that the Blood bubbling up within the Arteries, and being very much rarefied, whereby being separated from thence it might pass into the Veins; there is a necessity that it should put off its ferocities and divert them to some other place.

As

As this is performed every where through the whole body, so more copiously and after a certain peculiar manner in the Reins.

But though it be commonly enough known that the separation of the *serum* is made in this place, yet it is very much controverted by what means it is done, whilst these affirm the serous liquor to be drawn to the Reins, to be there only strained thorow; and others believe a certain ferment to be established in the Reins, by whose inspiration the *serum* of the Blood, as that of Milk, is scattered and precipitated by a sharp coagulation; and the odor, and the rank and ungrateful favour of this *Viscus* seems after a sort to argue that the thing is so. Before that we can certainly determine any thing of the virtues of Medicines which provoke Urine, and their manner of operating; it will be necessary to unfold this doubt; what is performed in the Reins by the accustomed means of Nature, and what in the sanguineous Mass, for the separation of the *serum*.

And first of all there is no need of proving the *serum* not to be drawn to the Reins among Philosophers, when that of late similar attraction has begun to be wholly exploded by most *Virtuoso's*, and all local motion is affirmed to be made only by impulse. And indeed, what has regard to the present business, by whatsoever things the circulation of the Blood is made known, it also plainly appears, that as the Blood so the *serum* being an inseparable Companion within its Vessels, is driven forward by the mere motion or impulse of the Heart to the Reins. But whether it be there separated by percolation or straining only, or also by a certain precipitation, we must, that it may plainly appear, a little more accurately inquire or search into the Anatomy and use of the Reins.

Concerning the structure and use of the Reins, as divers both ancient and modern Authors have published various things, the most famous *Bellinus* hath the most accurately shewed their Anatomy. Indeed every one hath shewed plainly the Blood to be carried to the Reins by the emulgent Arteries, and to be carried back again by the Veins: This the Laws and Inspection of sanguineous Circulation manifestly declare, but in what places, through what Pipes, and by what workmanship the *serum* in the Reins is separated from the Blood, and thrust away into the Receiver; lay hid a long while from the most diligent searchers, until the aforesaid Author by an happy invention, discovered the substance of the Reins to be neither Parenchymous, (clotted or congealed bloody substance) as the Liver and Spleen or Milt; nor fleshy Fibres, as the Heart and Bodies of the Muscles, but an heap of membranous little hollow Pipes, and by these so very small passages the *serum* being delated from the circumference of the Reins towards their Centre, to be distilled forth into the Receiver: For as much as the emulgent Artery being divided into greater Branches, then into lesser, and at length into very small shoots, conveys the Blood on every side to the utmost superficies of the Reins; but here when growing hot and rarefied, it sweats forth from the mouths of the Vessels, whilst the bloody part is received by the Veins to be returned back, the serous part is insinuated into the very narrow pores of the little hollow Pipes impervious to the Blood, and flowing through their Pipes on every side towards the Receiver, it is thrust down into a papillary substance, out of which it leisurely distills into the Receiver.

By this it appears that the *serum* is separated from the Blood, by a certain percolation in the Reins: Indeed after the like manner as when the same is thrust forth of the Arteries every where into the Glandula's, for the matter of Tears, of Spittle, of the droppings of the Nose, and of other Excretions. But further, it is to be thought, that this also is done as it were by the fusion of the Blood, for that the Blood being of its own nature clammy, and apt to be coagulated whilst that it passes through the Reins, it is very much scattered and attenuated by a lixivial ferment of this part; because that the serous water may separate more easily from it: For indeed Piss or Stale being imbued with saltness, whilst that it continually washes thorow the passages of the Reins, affixes to them saline Particles, and from thence infects it with a strong smell or with a certain lixivial besmearing, whereby whilst the Blood passing through those *Viscera* is inspired, it is preserved continually fluid from curdling, and apt to separate into parts in the straining, even as also Milk is defended from Coagulation by salt of Tartar infused. Yea Blood it self when sent forth from its Vessel, is wont presently to curdle and to be coagulated, by reason of a solution of salt of Tartar or Armoniack being thereon poured,

Part I.

How the serum is separated from the Blood within the Reins.

The serum is not drawn to the Reins.

The Structure of the Reins and

use.

The serum is separated from the Blood by a straining within the Reins.

The Reins are strong as it were with ferment.

Part I.

remains fluid: Therefore a real Ferment doth not, as is commonly beleeved, precipitate the Blood, but defends it from such a condition, whereby it may be it self more freely circulated, and its *Serum* may be separated in due quantity by straining. And truly it is plane enough, that the Reins are imbued with such a lixivial ferment in eating them being cook'd, which are by reason thereof of a very rank and ungrateful both tast and smell.

Part of the nutritious juice is sent away together with the serum thorow the Reins.

Whilst that the *Serum* is separated after this manner in the Reins partly by percolation and partly by fusion, not only the bloody part, but also the nutritious as to the greatest portion of it, passing thorow the very narrow Pores of that strainer, is carried back with the Blood by the Veins; in the mean time the ferous liquor, being imbued with a saltæis both in the sanguinous Mass, and by the ferment of the Reins, perpetually slides down by the urinary Pipes into the Receiver, and washes away, and carries with it a certain tenuous and more elaborated part of the nourishing juice, which is the *Hypostasis* or residence of healthful urine.

The matter of Urine proceeds chiefly from the Blood.

But truly Stale or the matter of Urine as to its substance, quantity, and quality, proceeds chiefly from the bloody Mass. For that, as this, hath three chief offices, as we have shewn else where, to wit, an accension or inkindling for to sustain the vital flame, an Instillation of the animal spirits into the Brain, and a distribution of the nutriment unto all pars; by reason of all and each of those, there is a necessity that it should be moistned with a great deal of watry humour, and should be continually rinsed with fresh, and the old still should be sent away, and that this should be done in a due and constant manner, is of great moment for the conservation of Health.

The serum is separated from the blood sometimes too hardly, sometimes too easily.

The fresh ferous Liquor is introduced into the Blood, together with the nourishing juice by an easie labour, and is for the most part thorowly mingled with it without any obstacle; but yet the old doth not always so readily and truly go away from it as need requires; but is wanting after divers ways about its excretion, and from thence the occasion of very many diseases arise. For truly the *Serum* sometimes sticks more unseasonably to the Blood, and will not extricate it self from its embraces, as in Fevours evilly, and not thorowly as 'tis judged, also in the phlegmatick Dropsie, and Cacochymy or ill digestion. But that sometimes although expulged by the Blood, the reins relinquishing it (which is its chief way of excretion) is diverted to some other place, as in Catarrh's, gouty or scorbutical fluxions, also in every dropsie: Sometimes also on the contrary, the *serum* passing away too soon from the fellowship of the Blood, before it hath performed its task flies away, and supping up the portions of the more profitable humours, snatches them away with it self, as in the *Diabetes* or pissing Evil, and in great floods of Urine which sometimes happen, and by and by cease again. In these kind of cases as often as the quantity of Urine is either too much defective or too much abounds, the Reins are not always or chiefly in the fault, but the Brain, and rather the Blood, for that its Mass now too strict and compacted, does not easily send away the *serum*, and other contents to be purged forth, now to lax and apt to be scattered abroad, doth not contain long enough both the *serum* and nourishing juice: Concerning which causes and the means whereby such irregularities happen, we will a little further inquire.

The reason of this is best unfolded by the fusion, coagulation and reduction of Milk.

And indeed the analogy of the Blood with milk, (which we have in another place more largely unfolded, and shall here briefly touch upon) conduces very much to the solving of this knot. You must know that Milk whilst that its mixture is kept whole, although it be warm or boyl upon the Fire; all its Particles being promiscuously tempered, do keep the Liquor uniform: But if any acid thing be put thereto hot, presently the more thick Particles grow thicker into coagulation, and in the mean time the watry with many saline Particles, are scattered into a tenuous and copious water. Yea it is a well known and vulgar observation, that Milk kept so long that it begins to grow sower, if it be set over the fire, will be coagulated of it self without any sharp thing being put into it. Moreover on the contrary, if that Milk be impregnated with any Salt of divers condition from acid Salt, as to wit, fixed, nitrous, or volatile, being first dissolved therein, it will not then be coagulated by any acid thing therein infused whilst it boyls upon the fire: For I have often try'd this with the salt of Tartar and of Wormwood, with mineral Crystal, with Flowers of Salt Armoniack, Spirit of Harts-horn, and others of the same kind. Further, which seems more wonderful, if any of these Salts or any solution

solution of them be instilled to milk boyling on the fire, and coagulated by some infused acid thing, the coagulation before made for the most part is taken away, and the white, hard, thick matter vanishes, and the liquor at length is rendred thin and almost limpid, although it doth not wholly resume the lactiform and homogeneous kind. And indeed I have sufficiently learned by often made experiments that these kind of mutations do constantly happen, viz. if Beer, Whitewine, Cyder, Vinegar, or any acid juice whatsoever, be dropped into Milk hot over the fire, presently leaving the whole form of Milk it goes into a white thick matter, and a diluted *serum*. Then if to all this yet warm, the salt of Tartar, Wormwood, or any other deliquated vegetable whatsoever, or a solution of Salt Nitre, or Armoniack, yea the Flowers or Spirits of these, as also the spirits of Harts-horn, of Soot, and such like be poured in, and the mixture be a little agitated, almost the whole Crassament doth vanish quite away, only some small portions, and certain little coagulated bits remaining, which will swim dispersed up and down thorough the whole Liquor. Further yet on the contrary, if that fixed or nitrous Salt, or Flowers, or Spirits of Salt Armoniack, or also Spirits of Harts-horn, or of Soot, be cast into boyling Milk, and then if you should pour into the hot Liquor, Ale or Whitewine, Cyder or any other sharp Liquor you please, no fusion or coagulation of the Milk shall follow thereupon. It will be worth our labour to consider here from what causes each of these are made, and what analogy they bear with the fusion, or inextricability or disintanglement of the *serum* in the sanguinous Mass.


 Part I.
 

By what means
the coagulation
of Milk may be
inhibited or taken
away.

By the anatomy of Milk it plainly appears, that there is in it fewer spirituous Particles, very many watry, sulphureous and terrestrial indifferent, and in like manner saline, which are partly volatile and partly fixed: Therefore whilst that the mixtion is kept whole, the saline Particles sticking to the sulphureous, divide them one from another, and also hinder them that they flee not away, or be combined with the Terrestrial. In the mean time, the serous coming between the rest so equally intermixt, fill up all the vacuities and make the Liquor as it were homogeneous; but then that there should presently follow a fusion and coagulation of the Liquor upon some sharp thing being poured to it, the reason is because the fluid Particles of the Salt in the acid thing, take hold of whatsoever others saline, to wit, both fixed and volatile, are in the Milk; to which whilst they are strictly united, the sulphureous Particles sliding from the embraces of the acid Salts do come together, and so being combined mutually among themselves, and with the terrestrial, they cause that thick substance separating from the rest of the Liquor: In the mean time, the watry Liquor having its pores almost emptied of its Sulphur and Earth, and almost only impregnated with the combinations of the Salts, by and by it becomes thin and diluted. That the thing is so, it plainly appears by the even now cited experiments, for as much as this coagulation of the Milk is hindered or taken away, by the casting in of Salt either fixed, nitrous, or volatile; for every one of these Salts lays hold on the acid Salt of the infused Curd, and so prevents or breaks off its combinations with the saline Particles implanted in the Milk: But that the coagulation of the Milk being done away, it is not restored to its pristine form; the reason is, because the extraneous Particles of the adjoined Salts remaining still in the mixtion, do hinder the reintegration of the same mixture; but if they could be taken forth again, certainly the first mixture and lactiform would return again: Wherefore it may be thought of the Blood, that it being at any time depraved, although by fusion or coagulation, because it is wont to exterminate from it self all the heterogeneous Particles, it may recover its due and pristine mixtion.

The reasons of
them are shewed.

But that Milk being long kept and growing sower, should coagulate upon the fire of its own accord without any acid thing being infused; the reason is, because in that Liquor then tending to putrefaction, the volatile saline Particles (as the manner is) being depressed into the *fluor* or stream, they become acid: Wherefore these, the pores of the Milk being opened in the boyling, snatch hold of their fellow saline-fixed Particles, to which whilst they adhere, the sulphureous slide away from them, and being mutually combined between themselves, and with the terrestrial, they make the white thick substance, the *serum* together with the combinations of the Salts, being fused or melted into an *aquositie*. Cold Milk neither of its own accord, nor by any sharp thing being poured into it

is

Part I.

is coagulated, because, whilst that the Pores are shut, the intestine Particles howsoever disposed so as they may be ready for new marriages or divorces, do not easily unloose themselves, but the Passages being opened by the heat they presently enter into private Combinations, and Schisms or Separations, as occasion serves.

What Analogie
there is in the
Blood to the Co-
agulation of
Milk, and of the
Inhibition or re-
duction of this.

These things being admitted thus concerning the Fusion and Coagulation of Milk, and Inhibition and reduction from that condition, let us now consider whether in these any like or analogical thing is correspondent to the Blood, and indeed although it be granted that Blood being let forth of its Vessel, will not, as milk boyling over the fire, resolve into Constitutive parts, or variously scatter or coagulate, and then be again reduced from that Condition, by the affusion of Salts, because indeed the Consistencie of the Blood is thicker than of Milk, and is more apt to cloder, moreover this flame or its life being extinct, it is altered very much from what it was in the Vessels: but yet I have found by frequent tryal, which the experiments of others confirm, that the same Liquors, which do fuse a precipitate Milk, as distilled Vinegar, Spirits of Vitriol, a Dilute of Salt or Nitre, and other Acids also being poured upon warm Blood, do presently coagulate it, and so discolour it, that it grows black in the whole Mass, one portion goes into a clottie Cake and the other into a watry and thin *Serum*.

What alterations
Chymical Li-
quors produce be-
ing poured upon
warm Blood.

Besides these, which inhibit, or take away the Coagulation of Milk, as Oyl of Tartar, fixed Salts of Herbs, a solution of Salt Nitre, of quick Lime, Spirits of Salt Armoniack, Harts Horn and the like being poured upon warm Blood, doth amend, or conserve its mixtion whole, as may be argued from its shining and red sparkling Colour, and its Consistencie remaining alike for a long time; wherefore as it easily follows from hence, it appears that Blood, although in an unlike proportion, is made up of the same kind of Elementary Particles, as Milk. Indeed there are in this more plenty of Spirit, Sulphur, Salt, and Earth; and less *Serum* than in Milk. From whence it may be concluded that the Blood being rightly disposed, to wit, more thick, and too apt to grow together or to clodder, is less able to be fused, and to be loosened into much serositie, notwithstanding whilst that it passes thorow the Reins in the Circulation, the superfluous aquolities, partly by the strainer of the Reins, and partly by their ferment, keeping the Blood from too much Coagulation, by degrees are separated and sent away. But when the Blood is vitiated in its complexion, there is a failing both as to its Constitution, and about the manifold separation of the *Serum*.

That the Blood
may rightly put
away the Se-
rum it ought to
be preserved or
reduced both
from too much
growing thick,
or too much fu-
sion.

As to the former, the Blood is now too hot and sharp, now too thick and feculent, and sometimes also above measure, thin and watry: and according to its degenerate sort of state various sicknesses arise, of which we shall not particularly treat in this place. But yet for as much as the Blood is amiss in its *Crafsis* or Consistence, though its *Serum* be separated in due measure and manner, no very great healthful Condition doth therefore presently follow. But the Origin of very many Diseases do happen, by reason of the separation of the *Serum* not being rightly performed. But as to this, as there may be divers manner of failings, the fault may be very much in the Defect, or in the Excess. For some-

Of the Separati-
on.

1. The separati-
on of the Serum
offending in ex-
cess.

times the Serous *Latex* sticks too pertinaciously in the Bosome of the Blood, and on the contrary, sometimes slides away too soon, and in this respect the Blood, not containing the *Serum* spews it forth by the little Passages of the Arteries, in very many places, and almost every where; and so thrusting it down into the *Viscera* or habit of the Body, produces an *Ascites* or watrie Dropsie thorow the whole Body, and now sending it away immoderately to the Reins, inforces a *Diabetes* or excessive Pissing. The Blood too much retaining the *Serum*, being very much heated as in a Feavour, hath its body too strict, with complicated and more thick particles boyled together, so that the more tenuous particles cannot easily break forth; or it being stuffed with Scorbutick Salt and Sulphur, becomes very viscid and tenacious, so that the serosities very hardly slide from the embraces of the rest. As thus the departure of the serous Liquor from the blood is after a divers manner hindred, or perverted, there are also Diuretick Medicines of a diverse disposition and operation, which notwithstanding may be distinguished: and first as to the end, according to which they have a regard to the Mass of Blood, or the Reins, or to both together. Secondly as to the matter, in which respects they are either Sulphureous or Saline, and these a-

Also in defect.

The Distributi-
on of the Diu-
reticks.

1. As to the End.

2. As to the
Matter.

gain

gain are various, according as the Saline Particles are in a condition of fixedness, of flowing, or of Volatility, or further as they are Nitrous, or Alchalisate. In the third place as to the form, these Medicines may be had in a divers manner, but for the most part their Compositions, as to their Species, are Drinks, or Powders, or Boles, or Pills, or Chymical Liquors; concerning which we shall particularly speak anon. In the mean time although it seems to belong rather to Pathologie or the treating of the Passions than to the Pharmaceuticks or Curing by Medicines, to explicate the single scopes or ends of Diureticks, yet I think it will be to the purpose to design or draw forth briefly the cheif of them here. And then in the second place to distinguish the diuretick Medicines as to the matter, which is almost in all of them only Saline, into certain Classes, and lastly, to add thereto the more select forms of prescriptions in every Kind.

First therefore when the Blood becomes so crass and tenacious by a fixed Salt with Sulphur and Earth incosted together and mutually combined, that the watry Particles do not easily separate from the rest; Diureticks of that kind are behoveful, which may make laxe its close joyning, and scatter abroad the *Serum*, which are rich in volatile or acid Salt: for such Particles do chiefly dissolve the Combinations entered into by the fixed Salt. For as much as this disposition is common both to the Fevour and the Scurvie in the former Disease, diureticks are chiefly proper, both the acid temperates of Vegetables, also of salt Nitre, of the Spirits of sea Salt, of Vitriol &c. Also such as are indued with volatile Salt, as the spirits of Harts Horn, of salt Armoniack, salt of Amber, of Vipers and of others of that kind which we rehearsed before in the Class of Diureticks. In the scorbutick Disposition when the Urine is both little and thick, the Juices of Herbs, and preparation both fower and acid are of egregious use, also salt and spirit of Urine, of *Sal Armoniack*, Tartar &c.

Secondly sometimes the Blood does not retain long enough the *Serum* within its close enfolding, but being obnoxious even to Fluxions or rather Coagulations, putting it away here and there plentifully in great abundance, stirs up Catarrhs or tumors in divers places; or else the Blood being habitually weak and also in ill disposition, to wit, inclining to sowerness, so far as that it is apt to coagulate its more thick Particles; therefore as the more thin are every where sent away in the Circulating, and falling down upon the weaker parts, they cause now Cephalick Diseases or Thoracious, now an *Ascites* or *Anasarca*. Moreover from a like cause the *Diabetes* doth arise as shall be declared by and by. But truly very many difficult Diseases, which are imputed wrongfully to the Dyscrasie of the *Viscera*, do arise from this Cause; to wit, that the Blood being evilly tempered, and obnoxious to Coagulations, when it cannot continue the whole thred of Circulation; it puts away the *Serum*, too readily apt to go away, in divers places. In these cases the Diureticks to be given should be of that kind which does not scatter the Blood, but take away its Coagulations, as they are which are indued with fixed, volatile and alchalisate Salt, besides such as strengthen or restore the ferment of the Reins as some sulphureals and spirituals. To these Ends are Diureticks, Sulphureous and Mixt Salts, the Lixivials of Herbs, the Pouders of Shells, Salt and Spirit of Urine and *Millipedes* or hog Lice, horse Raddish Roots, Parsly Seed, Nutmegs, Turpentine and its preparations, Spirits of Wine, the Virtue of all which is not to fuse the Blood, and to precipitate the Serofities out of its Mass (acids do that chiefly, and in those cases more often hinder the *Diuresis*) but to dissolve the Coagulations of the Blood, for the end that its close joyning together recovering a whole intire mixtion, and being more expeditiously circulated thorow the Vessels, it might sup up again the *Serum* any where gone out of the Vessels, or disposed, and at length may deliver it to be sent away by the Reins: by which means, according to both these almost opposite ends of Healing, the Diureticks of every kind should operate, and chiefly under what Forms they should be dispensed, we shall now shew next.

Part I.

3. As to the Form.

1. Saline diureticks.

1. What are requisites in the too strict joyning of the Blood.

Secondly what in the too laxe

Part I.

CHAP. II.

*The Kinds and Forms of Diureticks, also the Ætiology of the Chymical Preparations of them.**The divers states of Salts.**Their various affections.**Diureticks replenished with acid Salt.**For whom Convenient.*

First therefore, what belongs to the Saline Diureticks, ought to be referred hither, as we have often told you that Salts of whatsoever divers condition being commixed together, do mutually lay hold of one another, and by and by are joyned close together; and while they are so combined, other Particles, being loosened from the mixture do separate or fly away into Parts. This is plainly perceived when the fluid or acid Salt is mixed together with the fixed or Alchalisate, also when the fluid or fixed with the Volatile or sharp. In truth all the business of all sorts of solutions and precipitations depends upon this only affection of Salts. Wherefore as the Blood and the Humours of our Body, abounds very much in Salt, and being wont to be variously changed by it from one State to another and for that cause a morbid Disposition to accrue, and moreover as divers sorts of Saline Diureticks are full of fixed, fluid, nitrous, volatile or Alchalisate Salt, there will be always need of great Discretion and Judgment of the Physitian, that the Saline Particles in the Medicine may differ from those in our Body. By what means this may be done, we shall declare by running thorow every kind of Diuretick Salts.

Among the Diureticks imbued with acid Salt, the spirit of Salt or Nitre, also the Juice of Limons and Sorrel, white Wine, Rhenish Wine and Cyder, are chiefly and commonly noted, and very often perform that intention: for these do only fuse the Blood, and precipitate it into ferosities, even as sharp things dropped into warm Milk. Notwithstanding this does not happen to all alike, nor to every one indifferently. In a healthful constitution or not very far from it, the Salt of the Blood is partly fixed and partly Nitrous, and partly Volatile; also in some Scorbucal and Hydropical People it becomes for the most part fixed. Wherefore in all these cases Diureticks indued with acid Salt are administred with success: but in Catarrhus affections, and in some Hydropical and Scorbucal, when the Saline fixed Particles of the Blood are carried into the Form of a stream, and the Volatile are depressed (as it often happens) sharp acetous Remedies do rather hurt than good; for as much as they do more pervert the Blood degenerated from its right Disposition, but rather in these cases, Medicines indued with a fixed or Volatile Salt, are of Use.

*Forms and Diureticks which have an acid Salt for their Foundation.**Pouders.*

Take of Choice white Tartar pulverised of *Lapis Prunella* of each $\mathfrak{z}\text{ij}$, of the Pouder of Crabs Eyes $\mathfrak{z}\text{j}$. The Dose is from $\mathfrak{z}\beta$ to $\mathfrak{v}\text{ij}$, in a fit Vehicle, repeated every sixth or eighth Hour.

Take of Vitriolated or Nitrated Tartar $\mathfrak{z}\text{ij}$, Pouder of Egg-shells $\mathfrak{z}\text{ij}$, Parsly Seeds or wild Carrot Seeds $\mathfrak{z}\beta$, make a Pouder, the Dose $\mathfrak{z}\beta$, after the same manner.

Take of the best Spirit of Salt $\mathfrak{z}\text{ij}$, of Harts Horn burnt and powdered what will suffice to drink it up, make a Pouder, Dose $\mathfrak{v}\text{j}$ to $\mathfrak{z}\beta$,

Drinks.

Take of the Juice of Limons $\mathfrak{z}\text{ij}$, of Water of Raddish Compos. $\mathfrak{z}\text{ij}$, of Syrup of the five Roots $\mathfrak{z}\text{ij}$, make a potion,

Take of the Juice of Sorrel $\mathfrak{z}\text{ij}$, of white Wine $\mathfrak{z}\text{vj}$, mingle them and make a Potion.

Take of compounded Water of Raddish $\mathfrak{z}\text{ij}$, of Pellitory of the Wall $\mathfrak{z}\text{iiij}$, of

of the spirits of Salt \mathfrak{Dj} , fifteen drops of the Salt of Tartar, fifteen grains of the syrup of Violets $\mathfrak{z}\beta$, make a Potion.

2. Medicines indued with a fixed or lixivial Salt, are wont to be administred to move Urine, and it appears manifestly enough by the vulgar and empirical Medicines for healing dropical people: For it is usual in an *Anasarca* and sometimes in an *Ascites* when the *Viscera* or fleshy parts do very much swell up by the aggestion of waters, to drink a *Lixivium* made of the Ashes of Wormwood, or of Broon, or of Bean stalks with white Wine; from whence it frequently happens a very great plenty of making water to follow, and the Disease to be taken away. However I have observed that Medicine to have been not at all Diuretick to some, and rather to have encreased, than healed the Hydropick *Diathefis*: If the reason of which be inquired into, it appears by what hath been formerly said, that lixivial Salts do not fuse or precipitate neither Milk nor Blood, and therefore they are not by their proper virtue Diuretick; but notwithstanding that effect sometimes follows, for as much as fixed salt being copiously taken, destroys the Energetic of the acid or coagulative Salt being mighty in the Blood; because that the Blood, when before, incontinent of the *Serum* and too apt to be fused did exude it in divers places, by the coming of the fixed Salt might recover its due consistence, and therefore drinking up again the extravasated *Serum*, and carrying it continually to the Reins, caused a plentiful *Diuresis* or evacuation by Urine.

Part I.

Diureticks endued with fixed Salt.

For whom convenient.

2. Forms of Diureticks which have a fixed Salt for their Basis.

Take of the salt of Tartar or of Wormwood \mathfrak{zij} , of Coral calcined white $\mathfrak{z}\beta$, of Nutmegs $\mathfrak{z}\beta$, make a Pouder, the Dose is $\mathfrak{z}\beta$ to \mathfrak{Dj} .

Take of the Tincture of the salt of Tartar $\mathfrak{z}\beta$ to \mathfrak{zj} , Rhadish water *Composit.* $\mathfrak{z}\beta$, mingle them and let it be given in a draught of posset drink with the roots and seeds of the great Burdock boiled in it.

Take of the *Deliquium* of the salt of Tartar (whilst the tincture is extracted) flowing under, and of Wine impregnated with Sulphur \mathfrak{Dj} to $\mathfrak{z}\beta$, of white Wine $\mathfrak{z}\mathfrak{iiij}$ to \mathfrak{vj} , of the syrup of the five Roots $\mathfrak{z}\beta$, mingle them and make a draught to be repeated twice or thrice in a day.

Take of the Ashes of the twigs or buddings of the white Muscadine Grape $\mathfrak{t}\beta$, Nutmegs \mathfrak{zij} , pour them into $\mathfrak{t}\mathfrak{b}\mathfrak{ij}\beta$, of Wine or Rhenish Wine, let it stand warm and close shut for a days space, then strain it and keep it for use. The dose is $\mathfrak{z}\mathfrak{vj}$, twice or thrice a day.

Flints made hot in the fire and quenched in white Wine or stale *March Beer*: Drink of the Liquor \mathfrak{vj} or $\mathfrak{z}\mathfrak{v}\mathfrak{ij}$, twice a day.

Take of the water of quick Lime $\mathfrak{z}\mathfrak{iiij}$ to \mathfrak{vj} , of the Tincture of the salt of Tartar \mathfrak{zj} to $\mathfrak{z}\beta$, make a draught to be taken twice or thrice a day.

3. For the same reason as fixed Salt, sometimes also volatile Salt is administred with success to move urine in a sharp Dyscrasy of the Blood *viz.* for that its Particles being admitted into the Blood do destroy the prepollency of the fluid Salt in it; because that the blood recovering a due mixture being made free from coagulation and Catarrhs it reforbs or sucks up again whatsoever of the *Serum* is gone forth of the Vessels, and delivers what is superfluous to the Reins to be sent away by the Ureters. But notwithstanding in the mean time Medicines prepared out of volatile Salt, because they have Particles somewhat fierce and elastick, when they amend the disposition of the Blood they dispose what is superfluous of the *Serum* sometimes to be purged away as much by a *Diaphoresis* or evaporation by sweat as by a *Diuresis* or evacuation by Urine. To this Class of diureticks not only the pure unmixed volatile Salt drawn forth of the Animals or Minerals by distillation, but the integral parts of the living Creatures and Vegetables (of which sort are the powders and extracts of insects and sharp vegetables) ought to be referred.

Diureticks indued with volatile Salt.

wherefore they help.

Part I.

Their Forms.

3 Forms of Medicines which have volatile Salt for their Basis.

Powders.

Take of the salt of Amber, of the salt of the purest Nitre of each $\mathfrak{z}\text{ij}$, make a powder, the Dose is from \mathfrak{Dj} to $\mathfrak{z}\beta$, in a fit Vehicle.

Take of the flowers of salt Armoniack, of mineral Crystal of each $\mathfrak{z}\text{ij}$, mix them the Dose \mathfrak{Dj} , to $\mathfrak{z}\beta$, in a spoonful of Compounded Radish water. The Salt of urine is given after the same manner.

Take of the powder of Bees \mathfrak{Dj} , of Lovage seeds $\mathfrak{D}\beta$, make a Powder, let it be given in a spoonful of distilled Water.

Potions.

Take of the spirits of Urine \mathfrak{Dj} to $\mathfrak{z}\beta$, of the water of Radish Composit. \mathfrak{zj} to $\mathfrak{z}\beta$, of the water of Juniper $\mathfrak{z}\text{ij}$, mix them, make a draught. Spirits of Tartar are exhibited after the same manner in a double Quantity.

Pills.

Take of *Millepedes* prepared $\mathfrak{z}\text{ij}$, of the flowers of salt Armoniack $\mathfrak{z}\beta$, of Nutmeg powdered $\mathfrak{z}\beta$, of Venice Turpentine what shall suffice, take four Pills twice in a day.

Take of the powder of Bur-dock seeds $\mathfrak{z}\text{ij}$, of wild *Daucus* \mathfrak{zj} , of the salt of Amber \mathfrak{zj} , of the oyl of Nutmegs $\mathfrak{D}\beta$, of *Capivius* Balsom what will suffice, make a Mass, form it into little Pills, of which take in the evening, and in the morning iiij .

Apozem.

Take of the Roots of Chervil, Parsly, Fenil, *Eringo*, Cammock or Restharow of each \mathfrak{zj} , of the leaves of Saxifrage, of Clivers, or goose Grass, of each j M , of Cummin seed, of stone Crop, of each $\text{M}\beta$: of Juniper Berries $\mathfrak{z}\text{vj}$, boyl them in Spring water fb iiij , till half is consumed, add to it of Rhenish Wine fbj , of the best Hony $\mathfrak{z}\text{ij}$, make an Apozem the Dose $\mathfrak{z}\text{vj}$, twice a day.

Distilled water.

Take of fresh *Millepedes* or Hoglice fbj , of the leaves of Cleavers, Chervil, Saxifrage, golden Rod, of each Mij , of wild radish roots $\mathfrak{z}\text{vj}$, of Nutmegs \mathfrak{zj} , of Juniper berries, wild Carrot seeds, of each $\mathfrak{z}\text{ij}$, being cut and brused pour them into the Whey or Serum of milk made with white Wine fbviii , distil it in the common Stills and let the whole liquor be mixed together. The Dose $\mathfrak{z}\text{iiij}$, twice or thrice in a day.

Expressions.

Take of fresh *Millepedes* washed to the number of 40 or 60 of Nutmeg $\mathfrak{D}\beta$, let them be brused together and put them into the distilled water of Saxifrage $\mathfrak{z}\text{iiij}$, make an expression and let it be drunk.

Take of the Leaves of Chervil, of Parsly, Alexanders, of each M iiij , let them be brused together and put into white Wine $\text{fbj}\beta$, squeeze it forth very hard, let it be kept in a Glass, the Dose $\mathfrak{z}\text{iiij}$, twice in a day.

Tinctures.

In like manner the Tincture of *Millepedes*, of Bees, of Grasshoppers, or of *Cantharides* dried, the Tincture of salt of Tartar: given from 15 or 20 to 30 Drops in a fit Vehicle.

Diureticks induced with antinous Salt,

'Tis plane from the Figure, Colour, Taste, and other properties, and accidents, that Nitre is a certain *genus* of Salt. However it is divers from any other Salt or the condition of saline Particles, and is neither acid, nor fixed, or volatile, but a state as it were in the middle between them. For so much it participates of volatile Salt, as whilst it is made, it must be joyned to the lixivial and fixed salt with the Ashes, that it might obtain a certain concretion, further when it is melted, by some Sulphur cast in it, by and by it is inflamed and flies away: But it so much communicates with fixed Salt, as being melted in the Crucible, it suffers a continual fusion, and perhaps perpetual, without any great loss of Parts or Particles. In truth Nitre is that whereby all the Plants do flourish, all living Creatures live and breath, and the flame or all sublunary Fire is enkindled and sustained, as we have shewed more largely in another Tract, which it will not be needful to repeat here.

The reason of its effects.

But as to our present purpose, it is commonly enough known that the salt of Nitre doth refrigerate the Blood, and strongly move Urine: but yet the Reason of either effect doth not so clearly appear, because Nitre is so far from containing cold carrying Particles in it self, that on the contrary nothing can be more igniferous

igniferous, as may be perceived in Gunpowder, and if it be distilled, flame, rather than vapour or fume will seem to come into the Recipient: yea the distilled *Stragma* like actual Fire burns or corrodes all bodies whatsoever which are put to it. Neither is it less to be wondered at how this, whose nature is so fiery, should so moisten the Blood, and fuse it into aquosities, for the provoking evacuation by Urine.

Part I.

That I may propose our Conjectures concerning these things, I say that Nitre does help to produce these effects in a twofold respect; viz. for as much as it is a Salt somewhat a kin both to the fixed, and to the volatile; and for as much as it is a fire exciter: As to the first we have observed Nitre (even as also fixed and volatile Salts) being put into Milk, to hinder or take away its coagulation; in like manner also warm blood being poured to this as well as to those is preserved from coagulation and discolouration. Wherefore indeed the Particles of Nitre, being taken inwardly; keeps whole or restore the mixtion of the Blood; because truly they will hinder or take away its fusions and coagulations, from which heats and the *Ischuria* or stoppage of the passage of the Urine, do very often arise.

But moreover Nitre, as much as it is fiery, being taken inwardly refrigerates the heated Blood and moves Urine: for that (as we have formerly hinted) enkindling more by its coming the flame of the Blood, before troubled, and intermixed with fumes, it renders it more clear and pure, and for that cause more gentle; and so as the Blood, before troubled, whilst that it burns more clearly by reason of the Nitre, is more lax'd in its close joyniting; the serous Particles are more easily extricated from the more thick, and more plentifully go away.

4. Forms of Diureticks which have Nitre for their Basis.

Take of prepared Nitre ʒij, of Barly water with Knotgrass roots, and candied *Eringo* roots boyled in it lbij, of the syrup of Violets ʒij, mingle them. The dose is ʒiij, twice a day. Powders.

Take of *Sal Prunella* ʒij, of sugar Candy ʒj, make a powder to be divided into six parts, take one in some convenient liquor thrice in a day.

Take of *Sal Prunella* ʒiij, of salt of Amber ʒij, make a powder, Dose ʒʒ, thrice in a day.

Take of *Sal Prunella*, of Crabs eyes, of salt of Wormwood, of each ʒij, mingle them, the dose ʒʒ, thrice a day.

5. It is vulgarly enough known also that testaceous or shelly, and some stony powders indued with an Alchalizate or petrifying Salt do sometime promote an evacuation by Urine or the *Diuresis*. For that in great stoppages of the water, the powder of Eggs shells, of the claws or eyes of Crabs is a present remedy to some. If the manner and reason of whose working be inquired into, it may easily be manifested that these Medicines do not fuse or scatter, nor sensibly precipitate the Blood. Therefore it may be said that these are sometimes Diuretick in an acetous dyscrasy of the blood and humours, for as much as they bind and restrain the acid Salts by their combination, to the end that the Blood, being free from fluxions and coagulations, might sup up the extravasated Serum, and transfer it to the Reins. Diureticks indued with Alchalizate Salts.

5. The Forms of diuretical Medicines whose Basis is an Alchalizate Salt. Their Forms.

Take of Eggs shells powder'd ʒʒ to ʒj, let it be given in a draught of white Wine or posset drink or of diuretick decoction twice in a day. Powders.

Take of the powder of Crabs claws or Crabs eyes ʒij, of the salt of Amber, of Nitre of each ʒj, of Nutmegs ʒʒ, make a powder, the Dose ʒʒ to ʒj, in a fit Vehicle.

Or the aforesaid powder with as much Venice Turpentine as will suffice to make little Pills, the dose iij or iijj, morning and evening. Pills.

Part 1.

Sulphureous and
Spirituos Diu-
reticks.

Not only saline but also some sulphureous and spirituuous Medicines, are rightly placed in the company of Diureticks, for as much as they produce that effect. Very many resinous Gums as chiefly Turpentine, and preparations out of them, oyles of Juniper, of Nutmegs, of Wax, and drops of other fat things being taken inwardly for the most part provoke abundance of Urine, and imbued with a sinell like Violets. I have known that in some Hydropical, and Scorbutick people spirit of Wine, and hot waters, yea and good Wine plentifully drunk hath provoked a *Diuresis*: the reason of all which is, because that the Blood being weak or waxing slower, or by reason of the defect of its fermentation, or through the power of the acid and coagulative Salt, if not lively enough nor equally circulated, as that it may contain within it self the superfluous *Serum*, even till it may deliver it over to the Reins, the aforesaid remedies for as much as they keep whole the mixtion of the Blood, or restore its weakness, they conduce to the promoting the *Diuresis*.

Forms of them.
Distilled waters.

Take of the Berries of Ivy, Juniper, and Laurel fresh gathered of each ℥ss, of wild Carrot seeds ℥iiij, of Nutmegs ℥ij, let them be all brused and put into a glass retort, with the best Venice Turpentine ℔j, spirits of Wine rectified ℔iiij, let them be distilled in a Sand furnace with a moderate heat till they are dry, having a care of an *Emperenna* or letting them tast of the fire, and you will have a Spirit, and a yellow Oyl, either of them egregiously Diuretick: the Dose of the Spirit ʒj to ʒij or ʒij, of the Oyl ʒss to ʒj, in a fit vehicle.

Tinctures.

To the *Amalgama* remaining in the retort, pour of the Tincture of salt of Tartar ℔j, let them digest for many days close shut in the sand Furnace, that a red tincture may be drawn forth. The dose of which is ʒj to ʒij or ʒj in a convenient vehicle.

Spirit and Oyl.

Take of *Millipedes* prepared ℥iiij, of Nutmegs ʒj, pour on them of the purest spirit of Turpentine, and of the tincture of the salt of Tartar of each ʒvj, distil them in *Balneo* with a gentle fire, and you shall have a Spirit, Oyl, and *Deliquium* of salt of Tartar, every one of them notably endued with a diuretick Virtue.

The Reasons of some certain Preparations.

I. Sal Prunellæ or Mineral Crystal, which is only purified Nitre.

Sal Prunellæ.

TAKE of select Nitre what you please, dissolve it in spring water or rain water, boyl it a little, and put it into a deep glass Vessel in some cold place to be Crystallized: Let the whitest only and purest Crystals be selected, which must be reduced to the highest purity by frequent Solutions and Crystallizations, which at last being fused in a Crucible, and poured forth into a silver Vessel, becomes a most white stone. This being pulverised, the Dose is ʒj to ʒss or ʒij. It cools the Blood being hot, and moves Urine.

The reason of it.

This preparation is made for that end, as the nitrous Particles may be separated as much as may be, and be pure and clear from the fixed Salt, and may be concreted by themselves into Chrystals; for that when Nitre is first made and elixivated from the Earth, its Particles are unable to grow together or to be Crystallized so, which makes a necessity, that the nitrous *Lixivium* should be largely lixiviated with Ashes, and impregnated with fixed Salt, whereby the nitrous Particles being partly united with the lixivials, and partly by the intervention of these; the waters extruded from the Pores, acquire a certain concretion or growing together: Wherefore when the Body of salt Nitre is formed by this means, the Particles of the fixed Salt are to be washed away from it as much as may

may be, by frequent solutions and Crystallizations, whereby it may be rendred more pure for the use of Medicine.

Part I.

2. Spirit of Nitre.

Take of the purest Nitre ℥ij, powder of Bricks ℥ij, let them be well beaten and mixed together, and put into a Glass or earthen retort made fast and defended and distilled in a reverberating Furnace by a fire gradually increased. The red fumes make the receiver to shine as it were with a certain flamy colour, and being condensed, they make an acid and highly corrosive *Stagma*. The Dose is drops iij to vj in a fit Vehicle. *Spirit of Nitre.*

Although Nitre being mixed with Sulphur, is fixed presently by any inkindling, and breaks forth into flames; yet being destitute of that, it may be melted in a Crucible, or distilled in a Retort without any deflagration. The powder of Bricks is added, that when the Salts are fused by the Fire, they may not mutually lay hold of one another and link themselves together, but being divided and drawn one from another, they may be driven forth from their subject by the force of Fire. *Its Axiology.*

The melted Nitre retains its inflammable virtue; but the Liquor being distilled, will rather put out the fire than kindle it: For if it be mixed with Sulphur, that mixture will hardly be made to burn, or less than Sulphur by it self. The reason of which is, because the nitrous Salt having suffered a flux or flux, is altogether altered from its first state, and gets almost a like acetous disposition, as other Salts suffering a Flux; yet an acid *Stagma* is drawn out of the Sulphur, which rather destroys the Fire, than that it should be inflamed by it.

3. Spirit of Sea Salt.

Take of Sea Salt fused and powdered ℥ij, of Bricks grossly powdered ℥ij, beat them together and mingle them; then add of greater pieces of Bricks to ℥ss, let them be well mixed and set fast in a Retort, and distilled in a Reverbatory, with a most strong Fire for twenty four hours: Rectifie the distilled Liquor in a glass Cucurbite by the heat of Sand, drawing off the phlegm or watry part. The Spirit will remain in the bottom of a yellow or little greenish colour; and of a very grateful smell and taste. *Spirit of Sea Salt.*

This Salt is very difficultly driven into an acetous Liquor, because its Particles being more Saline than any other minerals, to wit, Vitriol, Nitre, Alume, and most strictly combined together, and are not easily dissociated one from another by themselves, or may be pulled away from the embraces of the Earth; lest they should flow together, the powder of Bricks is mixed with it in a three fold quantity: and moreover greater pieces of Bricks is thought good to be interposed, that the Mass to be distilled being made hollow as it were with holes, it might be every where pervious to the Fire. Nevertheless in the distilling, the Salts being fused by the fire most often flow together, that afterwards they cannot be driven forth by any force of fire. *The Reason.*

The thing appears to be so, because if by an applied Artifice this Cohæson of the Salt among themselves and with the Earth is broken off, they may by a very easy work be forced into an acid *Stagma*: for example.

Take of the spirit of Vitriol not rectified ℥ij, pour this into the glass Retort to the Sea salt calcined and pulverised, and by and by distil it in Sand: the spirit of the Salt as it were driven away from the other most easily ascends, the spirit of Vitriol possessing its seat, viz. this being more heavy and strong, and being at once deprived, and greedy of a terrene habitation, drives the other from its seats; and invades them. *A more compendious manner of it.*

Part I.

4. Spirit of Urine.

Spirit of urine.

Take of the Urine of a sound man that drinks Wine, what you please, place it in a Cucurbit with a blind Head that it may putrefie in Dung for a Month, then distill it in sand: The distilled Liquor being rectified in a deeper Cucurbit, exhibits a Spirit and volatile Salt. This operation is more compendiously performed, if the fresh Urine be evaporated to the fourth part remaining, to wit, that the saline Particles, the phlegm exhaling, may be agglomerated more thickly with the sulphureous and terrestrial. To this settlement set fast in a Cucurbit, let there be poured a *lixivium* of Ashes, or of the Salt of Tartar, or a solution of quick Lime, then being put in an Alembick; distill it in a sand Furnace, by a very easie work you will have the Spirit and volatile Salt, which are depurated and separated by rectification.

The Axiology.

The Reason of these processes is this: For that the Urine consists of a twofold Salt, *scil.* both nitrous and volatile, together with a great deal of Sulphur and Earth, the Particles of the volatile Salt (whilst that the mixtion is whole) are so entangled and strictly combined with the other Salts, and the other more thick elements, that the Spirits cannot break forth; nor be pulled asunder or separated by the force of Fire, notwithstanding after that by a long putrefaction, the mixture of the Liquor is laxed, the saline volatile Particles at length extricating themselves from the rest, do first of all ascend in the distilling. Moreover the same effect also more easily succeeds, when the fixed Salt being diverse from the nitrous, is poured in; because whilst the Particles of this infusion are laid hold on by those of the other, the volatile Salt being slipped forth from its Chains easily goes away. Hither may be referred what we advertise hereafter, concerning the distillation of *Sal Armoniack*.

5. The Tincture of Tartar.

Tincture of Tartar.

Take of the purest salt of Tartar ʒvj , let it be melted, and let it flow in a Crucible, until it acquires a blewish or almost greenish Colour, then pour to the same being pulverised while it is hot, and placed in a firm Matrace with a long neck; the rectified spirit of Wine till it is covered ij or iiij fingers breadth, and let it be digested in a sand Furnace with a somewhat strong Fire for many days, until the Tincture is extracted. Because that by long digestion the spirit of the Wine acquires a red colour, it is for as much as the Particles of the fixed Salt, being after a sort exalted, are united to the vinous Sulphur. In the mean time, the remaining salt of Tartar being diluted by the phlegm of the Wine subsiding below into a *deliquium*, and flowing from beneath, goeth away by it self; which is far better than the common oyl of Tartar, for as much as it participates of the Wine, Sulphur, and in some cases where there is need of a diuretick Lixivial, it is a very laudable remedy. The Dose is ʒj to ʒij or ʒj . The Tincture is given from ʒj to ʒij , or ʒij .

The Reason.

The Tincture of the salt of Tartar by reason of the conjunction of the Salt and Winy Sulphur, is imbued with a most fragrant taste and odor. If you shall distil the Liquor to the midst, the remaining part retains more of the Salt and Sulphur in it self, but less of the vinous Spirit; but the Spirit being drawn off and poured upon fresh salt of Tartar, if it be digested, for as much as it is wanting of the Sulphur when it is united with the Salt, it does not easily acquire a Tincture.

Truly that there is in the spirit of Wine a sulphureous part, distinct from the spirituous; I learned from this Experiment.

Sulphur or Oyl of wine.

Take of the sharpest spirit of Vitriol ℥ss , of the rectified spirit of Wine ℥ss , mingle them in a glass retort, and distil them in a sand Furnace; until the Liquor (which first seems homogeneous) being drawn off, a copious black thick settlement remains in the bottom: Let this Spirit be again poured back upon the *Caput mortuum*, and let the distillation be repeated with two or three Cohobations; at length you shall have two distinct immiscible Liquors, *viz.* one an acid-spirituous subsiding below, and the other a most clear oyl swimming above it; which without

without doubt is the most pure unmixed sulphureous part of the Wine, separated and remaining by it self, whilst the spirituous part is wedded to the acid Salt.

Part I.

6. Salt of Amber.

Take of the whitest Amber pulverized ℥ss , let it be distilled in a Glass Retort, either with a most strong heat of Sand, or a light Reverbatory: First, there will ascend a phlegm and yellow Oyl with a little spirit; then the volatile Salt will be sublimed into the neck of the Retort, and sides of the Receiver: And lastly a black Oyl will come forth before it ascends. This ought to be taken away, and the Receiver to be changed, lest the Oyl be polluted by it.

At first, white Salt of a very grateful odor and savour, unless it be kept in a Vessel very closely shut, in a short time becomes yellow, and then red with a very stinking smell: The cause of which is, for that this Medicine contains much of Sulphur in it self, whose Particles whilst the Salt hath dominion, being subjugated and involved with others; are altogether obscured, but afterwards being lax'd they emerging from their binding mixture, and overtopping the others; they for the most part shew their excellency to our Senses. Its Dose is ʒss to ʒj , the best way of keeping and of giving the salt of Amber, is to mix it with double the quantity of the purest salt of Nitre.

The Reason.

CHAP III.

Of the too much Evacuation by Urine, and its Remedy; and especially of the Diabetes or Pissing Evil, whose Theory and Method of Curing, is inquired into.

THe Diabetes was a Disease so rare among the Ancients, that many famous Physicians made no mention of it; and Galen knew only two sick of it: But in our Age given to good fellowship and gulling down chiefly of unallayed Wine; we meet with examples and instances enough, I may say daily, of this Disease. But yet as familiar as it is, and though it be known as to its Type, its causes and formal reason notwithstanding, is almost altogether unknown. That I may be so bold to Philosophize, or rather to conjecture concerning these; we will first of all give you a description of this Disease, as to all or the chief Phenomena of it: Then we will endeavour diligently to find out from the fault, of what part or humour every of them single do arise.

The Diabetes formerly rarely and not yet well known.

Diabetes is called so from $\delta\iota\alpha\beta\alpha\iota\omega$ Transeo, or passing through too swift a passage of the matter that is drunk, also a profluvium or thorow-flux of Urine. Those labouring with this Disease, piss a great deal more than they drink, or take of any liquid aliment; and moreover they have always joyned with it continual thirst, and a gentle, and as it were hectic Fever. But that as many Authors affirm the drink to be little or nothing changed, is very far from truth; because the Urine in all (that I have known who hath hapned to have it, and I believe to be so in all) very much differing both from the drink taken in, and also from any humour that is wont to be begot in our Body, was wonderfully sweet as it were imbued with Honey or Sugar. The occasion of the foresaid error (as I suppose) was the colour

its description.

Part 1.

*Its cause is not
the attraction of
the Reins.*

*But rather a De-
liquium of the
Blood.*

*The Conjunct
Cause is chiefly
in the Blood.*

*Sometimes partly
in the Reins.*

colour of the Urine, which always appears crude, and watry as of those labouring with the *Pica* or with the *Drople*. That we may carefully search out the reasons of these Symptoms, we must first inquire from whence so quick and copious an excretion of Urine comes, and then we will proceed to the shewing of the remaining Reason of this Disease.

It no way pleases us what some do assign for the cause of the *Diabetes*, the attracting force of the Reins: because the Blood is not drawn to the Reins but driven thither by the motion of the Heart. Further neither doth the *Serum* seem to be drawn or emulged from the Blood washing thorow them, but to be separated (as we have already more clearly shewed) partly by straining, and partly by fusion or a certain kind of precipitation: wherefore we believe the *Diabetes* to be rather and more immediately an affection of the Blood than of the Reins, and to take from thence its origin, for as much as the mass of Blood is as it were melted, and is too copiously fused into serosity: which easily appears truly from the quantity of the Urine increased into so great immensity, which cannot proceed but from a melting and consumption of the Blood. Wherefore also the remaining Blood, its *Serum* going away so plentifully, becomes more crass or thick, and more apt to be coagulated, as may be argued from the swift working Pulse: for the Heart is therefore more rapidly moved, that whilst it exagitates the Blood more than usual, it might preserve it from Coagulation. Further that the fluidity of this, apt to be dangerous by reason of the too great loss of the serous Liquor, might be continued, potent matter is most plentifully taken in an huge thirst provoking to it, and besides the Humours that are within the solid parts are sucked up from the Blood, yea their fillings are melted for the reparation of this; hence it is that those labouring with this Disease are exceeding thirsty, and quickly grow lean.

Therefore, that I may endeavour to shew the conjunct cause and formal Reason of the *Diabetes*, I am led to believe the *Crafsis* or mixtion of the Blood to be so lax and as it were dissolved that the watry Particles cannot be contained by the more thick, but that they quickly sliding from their embraces, and being imbued with saline Particles, do run forth thorow the most open Passages of the Reins. But in the mean time other humours both from without and from within for the moistning the Blood, and hindring it from coagulation, are conveyed into it; and the *præcordia* are urged even with an mighty force into a more rapid motion.

But besides we think the Reins sometimes to be some part of the conjunct Cause, for that their ferment is wont sometimes to be so vitiated, that it doth not preserve the Blood by any influx of lixivial Salt, in due mixtion, and fluidity, for the cause that the *Serum* might be separated from it by percolation only; but sometimes it happens from an acid Salt laid up in the Reins, that the Blood is precipitated whilst it passes thorow them, as it were by a certain Coagulation or runnet into a copious serosity, which is by and by sent away by the Ureters. Hence it is to be observed that a plentiful and limpid Urine is made by most of those obnoxious to the *Nephritis* or Gravel, in a violent paroxysm or fit. The cause of which is, that the acid Humour, delated thither by the nervous Pipes, (as we have somewhere shewen) and exciting Pain, doth first fuse the Blood sliding into the Reins, and causes the going away of a more plentiful *serum* from it.

But it is not improbable but that a plentiful *Diagnosis* or excessive evacuation by Urine, may in a sort proceed from an evil conformation of the Reins, for as much as their lymphathick little hollow *Tubuli* being too ample, and open, they receive too readily the serous Liquor, and transmit it too swiftly without any *Remora*, so that therefore its greatest quantity runs forth into Urine. But in truth as I may grant these little Tubes sometimes and chiefly in those troubled with the Stone or gravel, to be too open, yet for that cause there should be rather purged forth a bloody then a copious Water. And indeed we think a bloody Urine chiefly to proceed from some such Cause. Moreover when a copious and bloody Urine comes together, we judge a dyscrasie of the Blood to concur with an evil Conformation of the Reins, as shall be declared by and by in a notable case, of a certain sick person.

In the mean time as it is not to be doubted that the chief and most frequent cause

cause of the *Diabetes* consists in the Mixtion of Blood being too dissolute and lax; so also by the like Reason, the small *Diuresis* or lesser than ought to be also very often depends upon the too strict, and as it were close joyning of the Blood. Moreover we may opportunely inquire whether that the total suppression of the Urine does not sometimes proceed from such a cause? For though it is commonly enough known, that the cause of the *Ischuria* or more strong and pertinacious stopping of the urinal Passages, being most often placed below the Reins, depends altogether upon the urinarie pipes being wholly stopped; and when I my self have opened many dead by the Urines being wholly suppressed, I found in all the invincible cause of Death to have been an obstruction of the only Ureter a little before open (the other being long time shut up) by a Stone newly got in. Yet the most learned Doctor *Riverius* shews two cases of sick people in whom the *Ischuria* or total suppression of Urine, and that for many Days was cured by Phlebotomie only; and therefore he ascribes the Cause of the Disease to the Emulging Veins being above measure distended, so that they could not contract themselves for the expulsion of the *Serum*, even as it may be observed every where in the urinal Bladder, which being very full, is not easily compos'd to the making of Water. But indeed as we give belief (as 'tis likely) to these Histories, yet we ought not to assent to the *Ætiology*. Because that is not the office of the Emulging Veins, which that famous man hath assigned them, for not the Veins, but the Arteries constantly convey the *Serum* together with the Blood, without any danger of hardness or plenitude of Urine; but as the *Serum* does not quickly run forth into the open Passages, the reason seems to be, that the Mass of the Blood being too strict, and compacted hardly lets go out of its Bosome the watry liquor intimately mixed with it.

Hither may be referred the Anatomical Observation lately made on the dead Body of the Reverend Bishop of *Chester* when as that most illustrious Lord, being a long while troubled with the Stone, at last by a continual suppression of Urine had yielded to Death, presently all did presume, the cause of Death to have been the Ureters being wholly stopped up by a Stone or gravelly matter, but by a disquisition made through a most accurate Anatomic, not any obstruction at all in those Pipes, or impediment of the Urine could be found. The like anatomical observation was related to me by that most learned man, Doctor *Lower* not long before made by himself, where the *Ischuria* being deadly had not left any signs of it about the urinary Vessels: Hence it is easy to divine, for besides the reins were whole and sound, that the cause of this disease was altogether in the too great Concretion and Compaction of the Blood.

But to return from this diversion after having unfolded the conjunct cause, and the Reason of the *Diabetes*, we will proceed to the searching out its procacartick or more remote causes. Therefore if it be inquired into, from whence the joyning or compaction of the Blood becomes so loose and lax, and apt to melt into serosities; we say of this even as of Milk, that its fusion proceeds from this, for that as in its Mass Salts of a divers nature do agree, or are associated, the other particles (which separated themselves from them of course, and are contained in the mixtion) being freed from the Saline, presently go away into Parts. If that it shall be further inquired into, from whence those Salts come, by whose private combination we suppose the mixtion of the Blood to be loosed, and its fusion introduced; we need no long search for them: for it plainly appears, that there is naturally in the bloody Mass, fixed and volatile saline Particles, to which if at any time an acid Salt doth plentifully come, or obtains a flux, it will easily excite the afore said Affection. Hence it is that Rhenish Wine, Cyder, and acid Liquors being drunk provoke a more plentiful *Diuresis* or Evacuation by Urine; therefore also in some sickly People whose Blood abounds in an acid Salt, Medicines indued with a fixed or volatile Salt are wont to move the Urine. Neither doth this Affection still happen only from things taken, but from the humours produced within. It is observed that many obnoxious to Convulsive affections, before or after the paroxysms do make a great plenty of limpid, or clear watry Urine, the cause of which certainly is, for that the recrements or superfluities of the Blood and nervous Juice being heaped up in the solid parts, whensoever they being degenerated into a sowerness, shall swell up and flow back again upon the Blood, they induce its fusion, and for that reason a flux of Urine.

Part I.

As this disease often arises from the close joyning of the Blood being too dissolute,

So the suppression of the urine sometimes is from the too strict joyning of the Blood.

This is confirmed by anatomical Observations.

The procacartick Causes of the Diabetes.

They are first acid humors happening to the Blood, and fusing or precipitating it after the manner of Milk.

Part I.

The same kind of
acid Humour
chiefly from the
nerves and ner-
vous Stock.

Hence Spasmo-
dick Affections
ostentimes pre-
ceded the Dia-
betes.

How the Dia-
betes and the
Dropsey differ.

The evident cau-
ses of the Dia-
betes.

Wherefore when there is such a constant, and habitual profusion of Urine, nothing can be more likely said than that the excrementitious humours being sent away into the solid parts, and from thence after they had there contracted a fower-ness being returned into the Blood, they fuse or melt its Liquor into too much serosity, and for that reason provoke so continual, and immense excretion.

But we deservedly ascribe the chiefest part of this evil to the Nervous Juice, for as much as whensoever this departs from a right *Crafsis* or disposition, as we have else where shown, it becomes very malignant and deadly both to the other Humours and to the solid Parts; wherefore by this being depraved the mixture of the Blood also is chiefly in danger to be perverted. But we may well argue that the nervous Juice is depraved, because in the *Diabetes* the animal Spirits do very much languish, and presently all nutrition is frustrated.

Further, which may notably confirm this opinion, I have observed in many obnoxious to this Disease by intervals, that a little before they have fallen into a flux of Urine, they have suffered wandering pains, and corrugations of the nervous parts in the whole Body, sometimes with stupor or sense of pricking, sometimes with frequent Convulsions, and little seapings of the tendons, and other perturbations and inquietudes of the Spirits: being indeed a manifest sign, that the Liquor watering the nervous Fibres degenerating from its *Crafsis*, and being full of feculencies doth irritate the Spirits, and drive them into irregularities. Then afterwards when the recrements and superfluities of the nervous juice overflowing into the Mass of Blood from an arisen Flux cause a *Diabetes*, the aforesaid symptoms cease, but with a languor of the Spirits, and a failing of strength succeeding.

The *Diabetes* is commonly called the Chamber-pot Dropsey, and some affirm either the Disease to be indeed the same, and to have the same causes, and formal Reason, and the symptoms only to be varied as to the manner of the serous excretion; to wit, that the Blood in either being alike affected not able to contain the *Serum*, and being constrained to spue it forth from the Arteries, in the one pours it forth into the habit it self of the Body, and Cavities of the *Viscera*, and in the other, puts it aside in the Reins abundantly to be carried away by the Ureters. But truly if the business be more narrowly considered, there will be found a notable difference between these two Diseases. For the *Anasarca* takes its original for the most part firstly from hence, because the Blood being imbecill, and too frigid is not enough enkindled, and heated, that it might continually concoct the Chyle that is carried to it, and assimilate it, and so volatilize it, as thereby it might be contained in its bosome in the Circulation; but there is a necessity to spue this forth in all places together with the serous juice, and to leave it near the *Interstitia* of the Vessels: then afterwards the Disease growing grievous the blood is not only made weak by Crudities, but becoming degenerate in its complexion is obnoxious to fluxions, and to Coagulations, and for that cause begets serous humours more plentifully, and pours them forth upon the undue parts, more impetuously. But on the contrary in the *Diabetes* the Blood is enough, yea to the utmost hot, and too much enkindled and concocts swiftly, and beyond measure the Chyle is carried to it: yea it melts the solid Parts, and sups up their meltings, carries them about with it thorow the Vessels, and boyls or cooks it more then enough; but when as by reason of the meeting of Salts the *Compages* or consistence of the Blood is thorowly dissolved, and fused into serosities, portions being separated within the reins, whatsoever are able to break away, run forth by the Ureters. If any Disease like, but inverse to the *Diabetes* (to wit, in which the Blood being dissolved into serosities, did pour forth its liquids thorow the whole Body) did ever happen, without doubt it was sometime the epidemical Feavour called the English Sweat, where the Blood melting into aquosities did pour forth all the humours both profitable and unprofitable, even to the expence of the vital food, into the pores of the Body to be sent away by Sweat.

So much concerning the formal Reason and causes, to wit, the conjunct and more remote, of the Disease of the *Diabetes*, as to the evident, causes to wit, the occasions by which the acid juices, which excite the fusion to coagulation of the Blood, are begot in our Body, these are of a various kind and original. An ill manner of living, and chiefly an assiduous and immoderate drinking of Cider, Beer,

Beer, or sharp Wines; sometimes sadness, long grief, also convulsive affections, and other inordinations and depressions of the animal spirits are wont to beget and cherish this morbid Disposition: I knew one using Rhenish Wine for his ordinary drink twenty days together, that contracted an incurable *Diabetes*, of which he dyed within a month, notwithstanding all the remedies and counsels of a great many famous Physicians. I remember two Women obnoxious to convulsive and hypochondriack Affections, to whom accrued from thence a great flood of Urine with languor, and wasting away of the Flesh.

The Theory of this Disease being now explicated, there remains yet for us to shew the reasons of the known symptoms, I suppose some of them to be manifest enough out of the premises, to wit, wherefore there is so swift and copious an excretion of urine in the *Diabetes*: But that the sick are fevourish, and very thirsty, the reason is partly, because the humours and the juices by which both the Blood and the solid parts are moistened and refreshed, are by a too continual expence drawn forth by the *Diuresis*, or urinary evacuation, wherefore the throat is dry, and the *Præcordia* are greatly heated: and partly because the Heart by the urgent instinct of Nature, and the Lungs are provoked into a more rapid motion, that the Blood being deprived of the moistening Serum, might be hindered from coagulation or concretion or growing together, and might be continued in its due Circulation.

But it seems more hard to unfold, wherefore the Urine of the sick is so wonderfully sweet, or hath an honied taste; when rather on the contrary if according to our *Hypothesis* the fusion of the Blood and (which therefore follows) the profusion of the Urine happens by reason of the combinations of Salts, the Liquor certainly impregnated with these should be rather salt than sweet. But it is easy to unfold this in declaring first of all that the urine is deprived of its salt taste, for as much as many Salts that are of divers Nature are combined in it. For this appears by a manifold experiment in Chymistry, that if Salts that are of a divers Nature, as fixed and volatile, be mixed with an acid thing, the acrimony of either is diminished or lost; wherefore we need not wonder that the urine of those labouring with the *Diabetes* is not salt. But why that it is wonderfully sweet like Sugar or hony, this difficulty is worthy of explanation.

Some would think this effect to arise from this, that together with the Blood running forth thorow the Reins, both the recent nutritious Liquor, and the meltings of the solid parts are sent away, wherefore it should seem not improbable that this sweetness should be procured from these fat juices being mixed with Stale. But indeed from that mixture only a soft taste like milk or broth of flesh, pleasingly soft, but not sweet like hony should arise, yea but to this which is not only grateful but in a manner pricking, Saline spiculas or little stings together with sulphureous sweetnings (as I have else where shewed) ought to concur. Wherefore as we have shewed Sugar and Hony to be made sweet deservedly by the concretions of saline Sulphurs, so it may be suspected of the Urine in the *Diabetes*, that with the salts combined in the Serum sulphureous Particles picked forth of the Colliquation of the solid parts, do grow together.

As to the fore-knowledge, this Disease at first is often easily cured, but being confirmed most rarely or with difficulty. For as much as the disposition of the Blood being but a little lax, is reduced without great trouble, but that being very much loosed so that very many parts separate the one from the other, it scarce or never can be restored.

Asto what belongs to the Cure, it seems a most hard thing in this Disease to draw true propositions of curing, for that its cause lies so deeply hid, and hath its origine so deep and remote. For, what is commonly thought, that the Reins, and the other solid parts, containing or transmitting the Serum and the Blood are in the fault, because that they send away too hastily their contents, and for that cause astringing Medicines are chiefly and altogether to be insisted on: I say both reason and experience doth contradict both this *Hypothesis* and practice, for that few or none are cured by this Method: and it is highly improbable (if I may not say impossible) for that *Diuresis* to proceed from such a cause.

Therefore in this Disease as in most others there are three chief therapeutick Indications. viz. Curatory, Preservatory, and Vital. The first of those respecting the Disease, and endeavouring to restrain the excessive *Diuresis* or urina-

Part I.

The explication of notable Symptoms in the Diabetes.

From whence the often and copious pissing.

From whence the Fevour with thirst and languishing.

Wherefore the urine of the sick is sweet like hony.

The honied taste is not from the nutritious juice, but from the combinations of Salts with Sulphur.

Prognosticks of the Disease.

Three Indications of the curing Part.

Part 1.

The chief Intentions of healing. To hinder the fusion of the Blood.

2. To take it away being made.

which is probable to be effected by Salines of a divers Nature.

An History.

Example of the Cure.

ry evacuation, cannot be done without the Second, which aiming at the cause of the Disease endeavors to preserve, and to restore, the mixture of the Blood or its due Complexion. Wherefore the chief Intentions of healing as to the medicinal Cure of this Disease are to take care there be no fusion of the Blood, and if any be made to take it away. In the First place the fusion of the Blood is inhibited whilst that its more crass parts, and watry do continue themselves, and are contained together, neither the one go away from the other so continually and very hastily; which indeed is effected by thickning Remedies commonly so called; whose viscous and very glutinous bodies being admitted into the bloody Mass do pertinaciously stick close to its active Particles, and so separate them one from another, and hinder them, lest they should be mutually combined among themselves by an arisen flood or with suffused saline Particles from another place. For this end Rice, white Starch, also Gums, and some Resins are wont to be helpful in this Disease. In the second place, that the fusion of the Blood being already made, may be taken away, those sorts of Remedies have been made known which dissolve the concretions of the Salts, so that all the implanted elementary Particles, being at last made of their own kind, may recover their former State, and so make whole again the ancient complexion or *Crafs* of the Blood. Of this sort are such as have an effect on coagulated Milk, fixed, volatile, and nitrous Salts, also spirits of Harts horn, of *Sal Armoniack* and such like, as we have shew'd before. The reason of which is (as we have in the same place intimated) that whilst the saline, fixed, volatile or nitrous Particles, being in a sufficient quantity put into the Milk, do meet with the acid or precipitatory Particles, and are combined with them, the remaining saline Particles which are bound, being now freed and diffused thorow the Mass of the Liquor do dissociate the sulphureous terrestrial combined among themselves, and disperse them on every side, because that all the Particles being equally mixed again, they might mutually contain themselves, and be contained. So also by these the analogy of the Blood is altered by reason of the saline Stagmaspowred thereto being warm, we have there shewn by received experiments. But yet for curing the *Diabetes*, because that saline Medicaments are for the most part esteemed to be always Diuretick, we must not easily or rashly give them, although in the mean time, as neither reason so neither experience is contrary to this Method. For I have often prescribed in this Disease the tincture of Antimony with good success, also a water of a solution of quick Lime with shavings of Sassafras, Anis seeds, Raisins and Liquorish, according to the vulgar Receipt, is very much commended by some.

A certain noble Earl, noble both by the splendor of his Birth, and for those known excellencies of his mind, of a sanguineous temper, of a fresh Countenance, and in the strength of his Age, it being uncertain by what causes became too prone to a *Diuresis*; and so as for many months, he was wont to suffer oftentimes a *Profluvium* or flux of Urine, at length (as it seems) he fell into a confirmed, and deplorable *Diabetes*. For besides that in the space of a day and a night, he voyded almost a gallon and half of limpid Urine, wonderfully sweet, and as it were honied, he was also affected with an huge thirst, and a Feavour as it were heftick, with great languor of the Spirits, the failing of Strength, and Consumption of the whole Body. When at this time I was sent for to consult with the famous Physitians Doctor *Micklethwait* and Doctor *Witherly*, these following remedies (by the use of which he was seen shortly to grow well) were prescribed.

Take the tops of the Cypress tree *Mvij*, of the whites of Eggs beaten *ij*, of Cinamon *℥℥*, being cut small pour them into new Milk *℔viii*, distill it with ordinary Stills, taking care it taste not of the fire: Let him take *℥vj*, thrice in a day.

Take Gum Arabick and Gum Tragacanth of each *℥vj*, of penid. Sugar *℥j*, make a powder. Let him take about *℥j* or *℥j℥*, twice in a day with the distilled Water *℥iij* or *℥iiij*.

Take of powder of Rhubarb *15 gr*: of Cinamon *vj gr*: make a powder to be taken in the morning repeating it in six or seven days.

Take of Couflip water *℥iij*, of Cinamon Barly water *℥ij*, Syrup of *Diacodium* *℥℥*, make a draught to be taken every evening.

His Diet was only of Milk which he took now crude, and diluted with distilled water or else with Barly water, sometimes boiled with white Bread, or with Barly oftentimes in a day. When by the use of these he grew better every day, within

within a months time he seemed to be quite well : When he began to be indifferent well, the insipid Urine was not much more than the quantity of the liquids that he took, and then it was something saltish, and less than what he drank : Then after a little while growing strong, with his wonted order of Spirits, he returned to his former Diet.

But yet the disposition to this Disease did not so thorowly cease, but that afterwards being apt to relapse by frequent fits, by reason of any disorders of living, and perhaps by reason of changes about the times of the year; he at first made his Water more plentifully, and then limpid and sweet, with a feverish thirst and languishing of Spirits : But by the use of the same Medicines it was wont to go away again in a short time. Not long since after a long interval of health, a little before he began to fall into a flux of Urine, he suffered great enormities and defects in the nervous Stock ; viz. a numness or torpor and vertigo in the Brain, sudden Convulsions in the Members, little leaping of the tendons, and felt various runnings about as it were of a wind creeping here and there : Then when by the use of fit remedies, the aforesaid symptoms seemed to be cured; the *Diabetes* after its wonted manner (the matter flowing forth of the Fibers and solid parts into the Blood, and from thence to the Reins and urinary passages) returned afresh.

Part I.

A Relapse of the same disease.

At this time the aforesaid Physicians being called to Council, they advised the same method, and almost the same Remedies as had been formerly used, by the use of which when within a few days he began to find himself better ; it was thought good to be prescribed for him, water of quick Lime to be taken thrice a day about ʒv or ʒvj : By which Remedy having used it four days, he made his water in a moderate quantity, well tinged and coloured and somewhat salt, and as to the rest, he seemed almost whole, as he had been in times past.

CHAP. IV.

The Kinds and Forms of Ischuretical Medicines, or such as help to stop the Urine in Excess.

A Stringent Medicines properly called, to wit, Austere, Bitter and Styptick, which by corrugating the Fibres of the *Viscera*, and by contracting them into a shorter space, do stop their expulsive and excretory Force, and for that cause do hinder an excessive *Catharsis* upwards and downwards, although they are wont vulgarly to be prescribed, do effect little or nothing to the restraining the *Diuresis*, because the vertue of these hath no power upon the bloody Mass, and doth not reach to the Reins and Bladder. Wherefore in the *Diabetes* it is in vain, that the Barks and Flowers of Granates, Medlers, Tormentil Roots, and the like are prescribed ; as Reason tells us, so Experience confirms this to us. But the Remedies which are taken to help chiefly in the *Diabetes*, and do exactly quadrate with our *Hypothesis*, as we have before hinted, are of a double kind, viz. the first which do hinder the combinations of the Salts, and consequently the fusion of the Blood, of which sort are those which are said to be thickeners, and have viscous and glutinous Particles, which being admitted into the mass of Blood, do pertinaciously adhere to its active Particles and dissociate them, and do hinder that they may not be combined mutually among themselves, nor with saline Particles poured forth from another place. Secondly, which dissolve the accretions of the Salts, that they may restore the mixtion of the Blood, of which sort are the Salts of another nature, that are apt to cohere to the acid Salt, and to draw away

Astringents do not help in the Diabetes.

Three chief intentions of curing.

Part I.

away that from the combinations so begun in the Blood, as chiefly those Medicines endued with a fixed, as also with a volatile and alchalisate Salt. Besides these two chief kinds of Ischureticks, there remains another secondary, viz. Hypnotick, or causing rest; which by putting a stop or stay to the animal œconomy, makes the vital *Regimen* or Governance to be much more quietly performed, and for that reason with a lesser fusion of the Blood, or precipitation of the serous and nutritious humour. It rests now that we add some select Forms of every kind of these Medicines.

1. The thickening of the Blood.

1. The first scope of curing by which we endeavour by thickning the Blood, to take away its fusion or to hinder it, is performed by these following.

Powders.

Take of Gumi Arabick, Tragacanth powdered, of each \mathfrak{zj} , of Sugar'd Pellets $\mathfrak{z}\beta$, make a Powder and divide it into sixteen parts: Take one part thrice a day, dissolving it in distilled water, or in a decoction of the Roots of Comphry, in Spring Water, or Milk.

Electuary.

Take of resumtive Electuary $\mathfrak{z}\text{ij}$, of the species of Diatragacanth frigid \mathfrak{zj} , of Red Coral broken \mathfrak{zj} , Confection de Hyacinth. $\mathfrak{z}\beta$, gelly of Vipers Flesh what will suffice: Make an Electuary, of which take three times a day the quantity of a Walnut.

Decoction.

Take of white Amber, Mastick, and Olibanum powdered, of each \mathfrak{zj} , the powder of Haly $\mathfrak{z}\text{ij}$, of Balsom of Tolu $\mathfrak{z}\beta$: Make a subtle Powder, the Dose $\mathfrak{z}\beta$ three or four times in a day.

Take of the Roots of the greater Comfry, of water Lillies, of each $\mathfrak{z}\text{ij}$, of sliced Dates \mathfrak{zj} , of the seeds of Mallows, of silk Worms, Plantane, and Flea-wort, of each $\mathfrak{z}\beta$, boyl them in Spring Water $\mathfrak{lb}\text{ij}$, till half be consumed: Add to the straining of the Syrup of water Lillies $\mathfrak{z}\text{ij}$: The Dose is $\mathfrak{z}\text{ij}$ thrice a day.

Emulsion.

Take of the decoction of Barly with water Lilly Roots $\mathfrak{lb}\beta$, of sweet Almonds bruised $\mathfrak{z}\beta$, of the seeds of white Poppy, of Purslain, of Lettice, of each $\mathfrak{z}\beta$: Make an Emulsion according to Art. The Dose $\mathfrak{z}\text{ij}$ thrice a day.

A distilled water.

Take of the tops of Cypress Mvj , of the leaves of Clary Miiij , of the Flowers of blind Nettles, Comfry, and water Lillies, of each Miiij , of the Roots of water Lillies, and Comfry, of each $\mathfrak{lb}\beta$, of Mace \mathfrak{zj} : All of them being cut small, put them into new Milk $\mathfrak{lb}\text{viiij}$, distil them with an ordinary Still. The Dose $\mathfrak{z}\text{ij}$ thrice in a day, with the Powder or the Electucry above prescribed.

2. The reduction or fixing of the Blood.

In the second place, Although saline Medicines of every kind are accounted Diuretick, and every one of them in some Cases, for as much as they fuse the Blood, and make its serosities to go away more copiously, they are in a measure Diuretick: Wherefore the use of them may be well suspected in the *Diabetes*, yet for the reason above cited, to wit, that by meeting with the acid Salt (when it predominates in the Blood) they take away and hinder its fusion and deliquescency. I do not at all doubt but they may be administred sometimes with success, for the curing of the Fluxes of the Urine; and as soon as an opportunity shall be given, I have resolved to find out the truth of this, by cautiously trying it: And indeed it appears, that this may be safely enough experimented; because I have heard for certain, that one labouring with the *Diabetes*, was cured by an infusion of quick Lime. But for that the saline Medicines, (which take away the dominion of the acid Salt, and as we suppose, bind it, as it were, with Chains) are endued with either a fixed, or a volatile, or an Alchalisate Salt, I will recite some forms of Ischureticks, in which each of these are the Basis.

1. Medicines endued with a fixed Salt.

In the first place therefore, when the fixed Salt by it self, or joyned with Sulphur, is required for the ground.

Tinctures.

Take of the Tincture of the salt of Tartar, or of its *deliquium*, what will suffice, let it be given in a little draught of some decoction or distilled water, but now described, thrice in a day.

Take

Take of the Tincture of Antimony, let it be taken after the same manner thrice in a day, the use of this I have by frequent experience learned to be very profitable in this Disease.

Take of salt of Coral $\mathfrak{z}\text{j}$, let it be taken after the same manner.

Take of the infusion of quick Lime lbj , the Dose $\mathfrak{z}\text{iiij}$ or $\mathfrak{z}\text{ij}$ thrice in a day, taking before a dose of the Electuary or Powder above prescribed. Electuary.

Take of Conserves of the Flowers of blind Nettles, and of the greater Comfry $\mathfrak{z}\text{iiij}$, of the reddest *Crocus* of Steel $\mathfrak{z}\beta$, of Coral calcined to a whiteness $\mathfrak{z}\text{ij}$, Syrup of Comfry what will suffice to make an Electuary. The Dose $\mathfrak{z}\text{ij}$ thrice in a day.

Take of *lapis specularis* calcined $\mathfrak{z}\text{j}$, the dose $\mathfrak{z}\beta$ to $\mathfrak{z}\text{j}$, twice or thrice in a day. Countrymen with this Medicine happily cure their Cattle that make a bloody water. Powder.

Take of Coral calcined white and powdered $\mathfrak{z}\text{ij}$, powder of Gum Arabick, Tragacanth, of each $\mathfrak{z}\text{j}$, make a Powder, divide it into ten parts: Take one three times a day in a convenient Vehicle, to wit, boyled or distilled water.

Take of *Crocus Martis* the reddest $\mathfrak{z}\text{vj}$, of Gum *lac* powdered $\mathfrak{z}\beta$, red Sanders $\mathfrak{z}\text{j}$. Make a Powder, divide it into twenty parts, of which take one three times a day.

Take of Harts Horn burnt and powdered $\mathfrak{z}\beta$, let it be boyled in water of the Smiths Forge lbiiij till half be consumed, adding towards the end a Crust of Bread, of the Roots of the greater Comfry, of water Lillies dried, of each $\mathfrak{z}\text{ij}$, to the straining add of Sugar, Lozenges perled $\mathfrak{z}\text{ij}$, take of it $\mathfrak{z}\text{iiij}$ thrice a day. Decoction.

2. Medicines endued with an Alchalifate Salt, of which sort are Corals, Pearls, Cuttle Bone, Harts Horn, Ivory, powders of Shells, and such like, as they are commonly used against Rheumatick Diseases, so also for the *Diabetes*: And indeed according to our *Hypothesis*, for as much as they receive the acid Salt abounding in the Blood, and for that reason preserve the bloody Mass from fusion, a benefit is oftentimes not vainly expected from them.

2. Remedies endued with Alchalifate Salt.

Take of the reddest Coral made very thin, of Cuttle Bone, of each $\mathfrak{z}\beta$, of Harts Horn philosophically calcined $\mathfrak{z}\text{ij}$, of Pearls, of Ivory, of Crabs Eyes, of each $\mathfrak{z}\text{j}$, mingle them and make a Powder: The dose $\mathfrak{z}\beta$, thrice in a day in a fit Vehicle. Powder.

Take of the same Powder $\mathfrak{z}\text{ij}$, of the Species of *Diatragacanth frigid* $\mathfrak{z}\text{ij}$, of Sugar-Candy $\mathfrak{z}\text{ij}$, make a Powder with what will suffice of the solution of Gum Arabick, make a paste: Let it be made into Troches weighing $\mathfrak{z}\beta$, take ij or iiij thrice or oftner in a day.

Electuary.

Take of the same Powder $\mathfrak{z}\text{ij}$, of Electuary resumptive $\mathfrak{z}\text{iiij}$, conserves of flowers of water Lillies $\mathfrak{z}\text{ij}$, of the same Syrup what will suffice: Make an Electuary, take thereof the quantity of a Chesnut thrice in a day, drinking after it a draught of the Apozem, or distilled Water above prescribed.

3. For the same Reason that Medicines endued with a fixed and alchalifate Salt, so also those with a volatile, seem convenient for the curing the *Diabetes*: For these as well as they receive the acid Salt (by which the Blood is fused and melted into serosity) and draw it off, so that its liquor might recover its due complexion.

3. Remedies endued with a volatile Salt.

Take of Tincture solar with *sal Armoniack*, (as I was wont easily) prepared $\mathfrak{z}\text{j}$: The dose is twenty drops thrice in a day. Spirits of Blood, of Soot, of Harts Horn also may be tried in this disease.

A Tincture.

Take of Salt of Amber $\mathfrak{z}\text{j}$, of the reddest *Crocus Martis* $\mathfrak{z}\text{ij}$, mingle them and divide it into twelve parts: The dose is one part three times in a day. Powder.

What belongs to the third kind of Remedies in the *Diabetes*, viz. Hypnotick, which by stopping the animal Spirits retard the course of the Blood, and so hinder something its effervescency and fusion: I am wont

Hypnotick.

to

Part I.

to prescribe to some to take every Evening *Diacodium*, and if that does not do, liquid *Laudanum*, or quinced or tartarified, and to give it successfully now every night, now every other night.

Take of the decoction of Barly, with the dried Roots of Comfry ʒij ʒvj , of the Seeds of white Poppy ʒij , of sweet Almonds blached number vj : Make an Emulsion according to Art, to be taken every Night going to Sleep.

Take of the magisterial distilled Water above prescribed ʒiij , of the solution of Tragacanth ʒij , of *Diacodium* ʒij to ʒvj , to be taken going to Sleep.

Take of the conserve of water Lilly flowers ʒij , of tartarified or quinced *Laudanum* ʒj , of the Tincture of Steel, drops vj : Make a *Bolus* to be taken going to Sleep.

Sect.

S E C T. V.

Part I.

C H A P. I.

Of Sweating and Hydrotick Medicines, or Evacuating by Sweat.

THe Aliments for the nourishing of the Bodies of Animals, are taken in at one passage only, to wit, by the Mouth: But Nature provident enough, hath formed a manifold going forth or many ways of Evacuation, whereby the superfluities of the nourishing matter, or all the incongruous Particles either taken from some other place, or begotten within, might be cast forth adooors: Whatsoever of Food there is occasion for, it ought to enter always in at the same door, for that it might be sufficiently known and examined, for poysons would easily creep in through more, or poltern doors opening inwards together with the Aliments; that if any hostile matter for all the watch of this single door should enter in, or should be begotten by the fault of an internal governance, this might be able to lye hid in no lurking place or corner, but that there might be in the same place doors opened for its exclusion: For if any Heterogeneous thing should subsist in the first passages, it is purged forth by vomit or purging; if that going farther it should mingle it self with the Blood or nervous Juice, or stick close to the solid parts, by and by it is cast forth by transpiration and sweat, or else by Urine. But if that Nature for that it is slothful, or hindred, cannot either quickly or sufficiently send forth of its own accord, the extraneous matters by these passages, Medicine must supply with convenient Remedies, whereby every defect or fault about the manner and ways of Excretions may be helped. Therefore as we reasoning of Vomiting, Purging, and Evacuation by Urine, have more largely shewed already, what sort of Medicines destinated to those ends do produce their operations on the affections both of the Humours, of the Spirits, and of the *Viscera*; so now there remains in this place to be unfolded by what way and by what Medicines, a more plentiful *Diaphoresis* (or evacuation by sweat) or sweating, if at any time needful, is wont to be provoked. That these may be the better known, it is behooful in the first place to declare what the matter of Sweat is, and its formal reason, and in what, and by how many ways plentiful sweating very often happens without evacuation, by reason of external accidents, or by an intestine Orgasm of humors or spirits.

In the *Diaphoresis* or evacuation by Sweat contrary to Purging, the motion of excretion tends from the first passages, and as it were from the most inward Center of the Body to the Circumference: In both these the Arteries do carry more to the places of Evacuation, than the Veins do carry back; at other times the Veins do render back from the places which are opposite to them, more than the Arteries do force away. In purging, a greater load is imposed to be carried by the splanchnical Arteries, together with the Veins respecting the habit of the body: But it is quite contrary in evacuation by Sweat, because in this whilst the Arteries do convey more than ordinary towards the circuit of the Body, the Mesaraick Veins do carry away a greater provision from the *Viscera* of concoction, than the Arteries do bring thither. In like manner in the other evacuation, whilst the splanchnick Arteries do pour forth into the *Viscera* more than is due, the extrinsick Veins carry back more from the habit of the Body, than the Arteries carry thither. Wherefore as either evacuation is procured by many ways, so also this way not the least, viz. whilst the Arteries respecting either the *Viscera* or the habit of the Body are urged into more rapid motions, a greater load of humours is pressed into the Veins

One only way of Ingestion, many of Egestion lye open.

The reason of this is hinted.

How Medicine helps its defects by Evacuation, by Sweat, and likewise by other Excretions.

How Evacuation by Sweat differs from Purging.

Part I.

The matter of
Sweat is either
Elementary or
Humoral.

1. What the Particles of the former are.

which are of an opposite power. By what means Diaphoreticks do perform both these intentions shall be declared anon: In the mean time, we will take notice about the *Diaphoresis* in its kind, that sweating in respect of the ordinary perspiration is esteemed even as a *Diarrhœa* to the natural emptying of the Belly, to wit, that is only a quicker, and more intense transpiration. For as often as the Blood growing more hot than ordinary and as it were flaming forth, emits more copiously its hot *Effluvias*, these carrying with them many Particles of the *Serum*, make Sweat.

The matter of sweat may be called either elementary or humoral; as to the first, this in like manner as urine consists of Spirit, Salt, and Sulphur moderate, of more copious *Serum* and a very little of Earth. That it is so, is easily gathered from the expence of the Spirits in sweating, the watry substance, salt taste, unctosity and feculency of this Excrement: For indeed whilst the Blood for the prolonging the Life of living Creatures is continually enkindled in the Lungs, and from thence flaming forth is conveyed from the Heart by the Arteries into all parts, certain subtil, to wit, spirituous and sulphury Particles, being most fit to fly away, do copiously proceed from its enkindled and rarefied Liquor; which flowing forth thorow the Pores of the Body, snatch with them forth adooors very many little bodies of the *Serum*, and somewhat of the rest also. If that these kind of *Effluvias* be few, they fly away leisurely, and exhaling moderately, they vanish away almost undiscernable, but if these *Effluvias* being more heaped up do break forth thickly, whilst they can scarce pierce thorow the pores of the Skin, they are condensed into water, even as in like manner vapours being sent forth from boiling water, make wet the cover of the Pot that lies over them.

2. Of what the latter consists.

The ordinary humoral matter of the sweat is scarce any thing else but the *Serum* of the Blood, to which sometimes are joyned, if indeed that excretion be inordinate, portions of the nutritious and nervous Liquor, and other humours from the *Viscera*, *Glandulas*, and lymphick Vessels, being forced away, yea farciments or meltings of the solid Parts: But this, whatsoever it be, is chiefly cast forth from the Arteries, although we cannot deny that something besides doth sweat forth also from the Nerves; moreover something of Humour is attenuated into vapour by the force of heat, from the Fibres and solid Parts, which growes again into dew about the Skin. But indeed it is the Blood it self only, which by its heat makes every humour evaporate, and emits the cheifest part of what it sweats forth from its own bosom.

Three things required to sweating.

That sweat may copiously and easily break forth, these three things are required, viz. That the blood growing more hot then ordinary be more rapidly circulated, Secondly, that its *latex* or water, with very many watry Particles, and those soluted, that is, to be separated from the remaining Liquor, and apt to be resolved into vapour, may abundantly flow over. Thirdly and lastly, that the Pores of the whole Body may be sufficiently unlocked and lying open.

The first Condition is that the blood may be more rapidly circulated.

1. The reason of the first condition seems manifest enough, for unless the blood being rapidly circulated, is carried in so great plenty through the Arteries, that the residue cannot be all received in its reduction by the venose Artery, by the lymphick Vessels or insensibly exhaled by perspiration, there would be nothing superfluous, that might issue forth by sweat: for this *Latex* or water is out of the superfluous or rejected matter of those Pipes. But the Blood for the stirring up the more plentiful sweat is circulated more rapidly, for as much as it is driven about with a great force by reason of the more often and more vehement *Systoles* or Pulses of the heart. Of the effect of which as there are many evident causes, they may all of them or at least the chief of them be reduced to the two following kinds.

Which depends partly on the blood, and partly on the animal Spirits.

The efficient cause both for actuating and also variously altering the motion of the Heart, are the animal Spirits flowing from the Cerebell or little Brain; but the final cause is the circulation of the Blood: for, as its primitive motion is instituted for its sake, so accordingly as the blood ought to be circulated by reason of many occasions, either quicker, or slower, vehemently, or leisurely, or after other ways, for that end also the Beating or Pulse of the heart is diversly varied. How often soever therefore it is so intended that it might stir up sweat, it comes to be so done either by the necessity or need of the Blood, or by the Instigation of the animal Spirits.

How this Cause is from the bloods part.

Whensoever the Blood growes more hot than it ought or is enkindled, lest it should be choaked within the bosom of the Heart, it ought to be turned about more

ra-

rapidously. But of such an effervescency or enkindling there are too many causes, and pretexts. For sometimes the Blood being too much carried forth by its proper Sulphur, after the manner of Vines, swells up of its own accord. Further that, from hot things taken in at the mouth, by reason of an ambient or outward heat, a more quick motion of the Body, the shutting up of the Pores, and many occasions being heated or agitated above measure, and more than usually inkindled; requires to be so circumagitated or turned about, for that sweating might follow.

Part I.

2. Sometimes the Blood being quiet of it self is moved into an hydrotick effervescency, by the Instigation of the animal Spirits. For indeed in acute griefs, violent passions, in great impediments of the natural and vital functions, in the Agony it self of Death, and in other faintings or affections of the Spirits, when the health of the body is greatly in danger, the sensitive Soul; that it might conserve the vital flame of the Blood from expiring, instigates the Heart into a most rapid motion, whereby, whilst the Blood is driven about more impetuously, for the most part also sweat is stirred up.

And how from the part of the animal Spirits.

The second thing requisite for the stirring up of sweat is, that whilst the Blood grows exceeding hot, or is inflamed more than its wont, and emits plentiful *Effluvia*, its *Latex* or water in the serous humour which is apt to go away and to be exhaled from its remaining Mass, abundantly overflows; for otherwise a dry evaporation alone as from boyled oyl, also urged by a fevourish or any other intense heat breaks forth, and no sweat. Those whose blood is full of *Serum*, and have it somewhat soluted and lax, upon very light occasions fall into sweating. But if that the *Serum* be deficient, or be too much compacted by the Blood, or being very much thickned by reason of intosted feculencies, it is not easily separated; and if the burning heat of a continual burning fevour doth trouble one, and that most strong Diaphoreticks be administred, scarce any sweat at all follows.

2. Of the Ephidrosis.

The second Condition is that the joyntings of the blood be laxated and loosened.

Thirdly, it is required for the right procuring of sweating that whilst the Blood grows hot, and is sufficiently moistned by a watry and easily separable humour, the Pores also of the skin should be unlocked and lye open; for unless the Body be perspirable, it will be in vain to endeavour a *Diaphoresis* or sweating. Some have so very thick skins and almost not to be pierced thorow, that if helpt too by winter cold, thou mayest oftentimes wring out water sooner from a Pumice Stone than out of their hides.

3. The third Condition of sweating is that the Pores be open enough.

So much for the chief things necessary for the stirring up of the *Ephidrosis* or sweating, which for that sometimes they may be in some part defective, may be the cause that sweat hardly or not at all succeeds, so sometimes by reason of the excess of these, or some other irregularities about the humours or habit of the Body, too often and too plentiful sweating is wont to infest some; so much that the nutritious Juice is no sooner conveyed to the Blood, but the whole presently, with the serous water sweating out at the Pores of the skin, is spent in moisture. If we shall inquire into the Reasons of this, these three do chiefly occur, in some of which or in all together they seem to consist.

The causes of too much sweating are hinted.

1. A too great propension therefore to sweating arises, because the Blood is vitiated in its *Crafts*, and being made weaker doth not assimilate the nutritious Juice which it receives from the Chyle; wherefore, as a Stomach of a broken and unsound tone, it is compelled to vomit forth the infused humour, as soon as it is filled with it. Hence it is that nocturnal sweatings and very grievous do so very much follow in continual Fevours; for as much as in these the Mass of the blood (like sower milk, which being made hot over the fire, is fused of its own accord without the addition of any coagulating thing, and precipitated into serosity) is of so loose joynting, that it is upon every light occasion loosned in the mixtion. To which it may happen that the blood being impoverished is not fully inkindled, wherefore there is a necessity for it that the crude juices, that are but little wasted by efflagration, should whilst the blood is incited break forth more plentifully into sweat.

1. The first of which is Dyscrasy or debility or a more sparing inkindling of the Blood.

Secondly, It is not improbable that the too great propension to sweat does in some measure proceed from this cause, viz. that either the Reins or the Lymphæducts do not every where sufficiently perform their offices. For if by chance the superfluous serosities of the arterious blood are not sent away by this or that

2. The Evacuation of the Serum by other wonted ways being prohibited;

Part 1.

The third the
openess of the
Pores.

way, there will be a necessity that they must be somewhere stored up, hinder the circulation of the blood, and not seldom cause the Dropsy.

The formal Reason
and conjunct
Cause of Sweat.

Thirdly, If at any time for the aforesaid Reasons the sweating disposition shall affect one, the same may be further increased, and more often and more copious sweats may distill forth of the Pores of the skin, and passages shall be more open than ordinary; which kind of affection is sometimes from nature, and sometimes from some accident. I have known the Bodies of some to be so cribose or full of holes that they were not able to suffer the least breath of air, who also by every more quick motion, or by the heat of the Sun, the fire, or of the Bed, would be forthwith dissolved into moisture.

From these which are required to the full provoking of ἐφιδρώσιν or Sudation, and that too much cause it, thus laid down, it will be easie to gather, what both the formal Reason and conjunct Cause of sweat may be; for either consists in this, that the blood abounding in *Serum*, and lying somewhat loosened in its joyning, whilst that by a more quick pulse of the heart it is circulated more rapidly, and so more carried thorow the Arteries, than can be presently the bloody part returned back by the Veins, and the serous part sent away by the Reins and Lymphæducts; therefore there will be a necessity that whatsoever of the *Serum* is superfluous imbued also with other Particles, must sweat out thorow the sufficiently open pores of the skin.

It is more remote
causes.

What belongs to the other causes, of sweating, viz. Procatartick and evident, they which are of the former kind respect either the Mass of blood, or the animal spirits. For these (as we have already hinted) being obnoxious to convulsive, and other irregular Affections, sometimes either of their own accord or occasionally fall into explosive and inordinate motions; by which also the *Præcordia* being hugely agitated, they impetuously drive about the Blood, and cause it by that means to be loosened into sweats. But truly the antecedent cause of spontaneous *Ephidrosis* or sweating more often lies hid in the bloody Mass: for if at any time heterogeneous Particles, and wholly incongruous, are heaped together to a fullness in its bosom, that, at length being burthened grows hot or works with an arisen Flux, that, what is burthened together with the serous water might be separated and cast forth adooors by sweat; which sort of sweat according to the easy, difficult, or impossible excretion of the offending matter is called either Critick (which is moreover more or less perfect) or Symptomick. We have largely enough discoursed concerning these in our *Puretology*, so that there is no need to say any more of it here.

The evident causes
of Sudation.

2. The evident causes of sudation to wit, which very much provoke by themselves a wonted *Ephidrosis* or Sudation without a *Procatartix*, or medical Indication, as they are various, and divers, viz. things taken in at the mouth, or outwardly applied, too great a commotion of the Mind, or Body with many others, it will be here convenient to note briefly the chief of them together with the distinct Reasons of their affecting: By which rightly understood will be better known by what means and with what diversity Medicines destinated to this business do move the *Diaphoresis* with sweat.

1. Agitation of
the Body.

1. In the first place therefore, sweat is wont to be provoked by a more quick motion of the Body, as may be well perceived in running, leaping, carrying of burthens, pulling or drawing and such like. The reason of which is, because the Muscles of the Body being vehemently exercised, they press together the interposing Vessels, and so thorowly agitate the Blood, and drive it too and fro strongly; and as by this means the Veins are very much strained, the Blood more easily slides forth, and creeps much more swiftly towards the heart thorow their Pipes being more and more opened; and so as it is more copiously laid up together within its right bosom, it oppresses it, or almost choaks it, and the Heart and Lungs, for the more rapid driving about of the blood do diligently labour by quicker and stronger endeavours: hence at length as that is more inkindled within the *Præcordia*, and by that means rarefied, and made loose in its joyning, it exhales far more little bodies of heat, that is, of Spirit and Sulphur; which carrying forth adooors with them the ferocities (whilst all the Vessels do so swell up) unable to be reduced, cause sweat. And as of the Body, so also the immoderate exercises of the Mind move sweats.

To which are also
added the passion
of the Mind.

2. The

Part I.

2, The ambient heat as that of the Sun, Fire, a Bath, Hot house, or such like, is apt to provoke sweat; because hot *Effluvias* being sent from without into our Bodies, and entering somewhat into the skin, unlock both its Pores, and passages, and also make hot the Blood, and compel it as water over a fire to boyl up; and so as being loosned from its joyning together, and rarefied, the sudorifick vapours more copiously are exhaled. Neither doth the meer extrinsick Heat move sweat only, but also that proper heat being detained about the compass of the Body from whence it did exhale. For there is nothing more usual than that any one lying in Bed, whilst he is covered with many bed-cloaths should fall into sweat. The reason of which is clear enough, for the breathings forth already departed, and being restrained about the superficies of the body hath the nature of a dry Bath.

Sometimes the restraint of usual transpiration causes Sweat; the reason of which is because the Blood being prohibited from a more free breathing forth, as Must or new Wine being too strait shut up in a Cask, more impetuously ferments; and thence being more rarefied and consequently being agitated in a more rapid circuit, there is a necessity for it to be dissolv'd into sweat. In times past it was a custom among the Irish, if any one were sick of a Feavour, to roll him up in woollen cloths wetted with cold water, by which means a plentiful sweat succeeding the disease was often broken. The like experiment I have heard to be try'd with our Countrymen with good success.

4. Hot aliments being taken, especially Salt, Pepper, and candied Spices, also drinks of strong Waters, strong Beer, and generous Wines, for as much as they imbue either the Blood with active Particles or with provokatives, as it were a certain sting or fury, or that they minister to it being very hot and burning, sulphureous and inflammable nourishments, as it were oyl to a Lamp, they stir up a more plentiful *Diapneon* of halituous or breathy matter, and for that cause greater sweatings forth of the abounding *Serum*.

So much for the Nature of Sweat, and of both the conjunct and manifest causes. As to what be ongs to its differences, it is wont to be distinguished many ways, to wit, that it was spontaneous or forced, or partial or universal, or critick or symptomatick, the reasons of all which are clearly enough made known by what hath been already said. Moreover sweat is either hot, of which we have discourf'd hitherto, or cold in the Act, which sort is frequently excited by a panick fear, a very acute grief, swooning, and in every sudden failing of the Spirits, and the agony of Death. The cause of this seems to be, that from a huge and sudden passion, the whole soul sinking down contract its compass, and therefore the Spirits being scatter'd, and the Blood with the heat being drawn back towards the Heart, the outmost *Effluvias* passing forth thorow the skin being left by the following, and destitute of Heat, therefore they are condensed into a cold Vapour, even as by the like Reason it is wont to happen in distilling. For if you suddenly repress or extinguish the fire, presently the warm exhalation filling the Alembick is resolved into a dew.

From these things thus premised and shown, which are chiefly requisite to the provoking of Sweat, and by which occasions chiefly, and ordinary accidents it is wont to be stirred up, it will not be difficult to shew with what powers and Particles Diaphoretick Medicines ought to be enricht, and by what means they produce their effects. And first of all, as to what belong to their Properties or Virtues. Hydroticks or sweating Medicines that are to be taken inwardly ought to be of that kind which may make the blood to be more hot than ordinary, and by consequence to evaporate; also which may after a sort unlock and fuse its Mass oftentimes too much compacted, and thickned, that from thence its serosities may more easily be separated and go away, and at the same time dispose them so separated, rather to be cast forth by a *Diaphoresis* or sweating than by Urine or Siege. These are the two primary requisits or Indicancies to the *Ephidrosis*, by the right accomplishing of which the Diaphoreticks of a various kind and energy are wont to be administred. As to what belongs to the three things requisite (which we made mention of before) *viz.* the apertion of the Pores, this is effected for the most part only by external Applications, but yet by what means and after what manner it is wont to be done, shall be shewn hereafter. In the mean time that we may speak of sweating Medicines that are to be taken in at the mouth, it behoves us in the first place to shew by what general means those do operate; then by what

2. Ambient heat.

3. The hindrance of wonted transpiration.

4. Hot things taken inwardly.

The differences of Sweat.

The causes of cold Sweat.

Of what sort Diaphoretick Medicines ought to be.

difference,

Part I.

The general reason of their Energy.

difference, and particular manner of affecting, and lastly with what virtue every kind, to wit, those wholly mixed or of one of the elements, viz. of Spirit, Sulphur, or Salt, being insinuated, do exercise their Power both in the *Viscera* and in the Humours about the provoking of Sweat.

1. As to the first concerning Diaphoretick Medicines in general, we note them to be such whose Particles are friendly enough to the Ventricle and Intestines, and do not provoke to any convulsion or excretory motion; moreover that they are in no wise to be overcome by them or to be assimilated like to Aliments; but that being taken into the Stomach they forthwith dispose both the animal Spirits, and also the Blood to yeild to an *Ephidrosis* or sweating. But indeed some of them being immersed in the Ventricle, and dissolved, by and by they stir up, and recreate the animal Spirits every where abounding in the nervous Fibres (of which the interior Coat is made) for the end that the *Hypostasis* of the whole sensitive Soul being presently erected, and stretched forth into a greater compass, they might make the *Præcordia* to be more lively actuated, and so the blood being rarefied and more inkindled, to be carried about more rapidly, and so to be driven into a *Diaphoresis* or sweating. Further, in the mean time the Particles of the same Medicine do pour themselves into the blood which waters the stomachal Vessels (which most thickly cover the nervous Coat) and whilst that they by and by ferment it, and make it to grow hot, they compel it to be forced thorow the veins more rapidly than it is wont towards the *Præcordia*; to which when it is more impetuously brought, presently the Pulse of the heart being increased the whole Mass of blood rarefied, and more inkindled, and by the Particles of the Medicine most intimately mixed with it, agitated, it is carried along more quick thorow the Arteries to all the exterior parts; where when all its water is not able to be carried back, or received by the Veins or other leading Pipes, there is a very great necessity for much of the serous humour to be resolved into Sweat. But the Particles of the sweating Medicine, being admitted according to the aforesaid manner into the Blood, do not only ferment and agitate its Liquor, but oftentimes they so loosen, and unlock its mission, that its *Serum* and other excrements may be more easily separated and sent away. But for as much as this may happen to be done by a divers means according both to the divers constitution of the blood, and the Nature or preparation of the Medicine; it will here be worth our while briefly to explicate the chief Indications about moving a *Diaphoresis* or sweating, and the various ways of prosecuting it, together with the Reasons of them. But it is further to be noted in the first place that Hydrotick or sweating Medicines as to their ways of working and operations, have a great affinity with most Cordials commonly so called; in so much that many things of either kind are of common use or reciprocal, and as they so differ chiefly as to their greater or lesser efficacy, as often as it is behoveful to pass from one kind to another, there is need almost only to augment or diminish the Dose, and chiefly to choose fit times for administering.

Sweating Medicines are near a kin to most Cordials or

The matters of sweating Medicines are either integral parts of the mixture.

Or Elementary.

As to what belongs therefore both to the various kind, and preparation of the matter out of which Hydrotick Medicines are taken; they are for the most part the whole parts or elementary of every mixture. To wit, they are either natural concretes in their whole substance, or simples, or extracts which are given, as when the Leaves, Roots, or Seeds of *Carduus*, *Contragerva*, *Angelica*, or the like are taken in Powder, Decoction, Conserves, or Magistery: or Diaphoreticks that consist in Particles of this or that element, to wit, spirituous, sulphureous, or saline, or in simples, or any other very excellent things; as if that Salt, or Spirit, or Oyl, are drawn out of *Carduus* or any other vegetable body, mineral or animal, and are reduced either by themselves or with other prepared things into the form of a Medicine, we will briefly touch of all or at least the chief of these kinds.

What are of the former kinds.

1. Diaphoreticks, whose virtue consists in the integral Particles of the whole Concrete, are inequally mixed, although they seem to excell in one certain element (viz. saline) more then in the rest of the Elements, and to own its virtue chiefly to it: But that salt, upon which the sweating force depends, offers it self in a double condition: For in some concretes it is volatile, and sharp or bitter, and in others Alcalisate, and as it were fixed.

1. In the first rank are very many vegetables, esteemed by the Ancients for Antidotes,

ridotes, as the leaves of *Scordium*, *Carduus*, Scabious Poyson-resister, the flowers of *Caltha*, Camomil, the Roots of Butter-bur, Zodoary, Galingal, &c. Also the confectiions of Mithridate, Treacle, *Diafcardium*, also decoctions of *Guaicum*, Box, and such like. The Medicines of which being put into the Ventricle and dissolved, they make a Tincture, whose Particles seeing that they are more hot and exotick, do awaken the animal Spirits, from whence the *præcordia* being more lively actuated, drive about the Blood more rapidly. But also they go in and ferment the blood, abounding in the stomachal Vessels, and so whilst they make it to be carried back quicker towards the heart, they are also a Cause, that it is vehemently and sweatingly driven forward through the Arteries into the habit of the Body. 2. The other species of Diaphoreticks, which whilst they consist of integral parts mixed, have a most excellent alchal Salt; are Stones, and bony and shelly parts of Animals and Vegetables, as *Bezoar*, Pearls, Eyes and Claws of Crabs, and such like, whose Diaphoretick Virtue proceeds chiefly from the Alchal Salt; for as much as its Particles sometimes meeting with an acid Salt, both in the *Viscera* and also in the Blood, and growing hot or fermenting with it, by that means cause the sanguinous Mass to be fused, and its serosities to be separated, and resolved into sweat.

Part I.

By what means they operate.

2. Hydrotick Medicines, which after the spagyrick *Analysis* owe their vertue, either to these or to those elementary Particles, being formed from various subjects, and with a diverse manner of preparation, are chiefly either spirituous or saline, or either combined one with the other, or with some sulphureous Particles. For such as are merely, or for the greatest part sulphureous, are less fit for this intention, because such being very infestous to the *Viscera*, oftentimes provoke a nauseousness, and not seldom vomiting: Moreover such as are Oily by reason of abundance of Sulphur and Fat, are not so ready to insinuate their Particles into the mass of Blood. We will make a special search by what means or by what affection of the Spirits or Blood, these other do move sweat.

2. Hydroticks whose Particles are elementary, of what sort, and how many they are.

1. And in the first place to the spirituous substance we refer Hot Waters and Liquors endued with any vinous Spirit, of which sort are abundance from the fruits of Vegetables, or from dry things matured by fermentation, or resolved by putrefaction, distilled by the chymical Art, as are the spirits of Wine, of Cyder, of Beer, of Juniper Berries, of Elder Berries, of black Cherries, with many others which are commonly called Spirits; and are taken either simple or limpid by themselves, or impregnated by the infusion of other simples, are distilled again or given under the form of a Tincture. These kind of winy Liquors being taken inwardly, for as much as they both set up the animal Spirits and provoke them into a greater expansion, (whereby in like manner the motion of the Heart is increased) and for as much as they agitate the Blood, and (as by the access of Oyl to flame) cause it to be more inkindled; they move sweat. For the same reason and means of affecting, whereby these are wont to be called Diaphoreticks, they may be also Cardiacs or Cordials, if they be given in a lesser dose.

1. Spirituous.

To the provoking of Sweat, prepared Salines of a various kind and diverse condition, use to be prescribed, and indeed with good success; which notwithstanding do not exagitate the blood, as Particles of the whole mixture, or merely spirituous, either by reason of their heterogeneity, or inkindle an inflammability, but only by forcing into its saline Particles, which whilst they snatch them into their embraces, they pull them away from their too strict combination with others, so that the joynting together of the Blood being laxed, and the Pulse increased, the superfluous serosities and other excrements, may be more easily separated and sent away by sweat. To this Cense or Rank (as in like manner we have shewed above to be in Diureticks, and as also will afterwards appear in Cardiacs) Salts almost of every condition ought to be referred, especially volatile, fluid, fixed, and nitrous Salt, out of which single or compounded among themselves Diaphoreticks of the chiefest note are gathered, which being inwardly taken and meeting with other Salts both in the *Viscera*, and also those abounding in the mass of Blood, and drawing them away from the embraces of other Particles, unlock the Blood and rarefie it, and so dispose it to a *Diaphoresis*. The chief kinds of these, and their manner of working, we will unfold anon; in the mean time notwithstanding, as these saline Medicines which are wont to move to sweats, are also given to move Urine, and sometimes also for Cordials, it behoves us to shew by what preparation,

2. Salines.

By what means they operate.

In how manifold a Condition their saline Particles are.

Part I.

With what preparation and manner of administration Diaphoreticks are to be given.

Both a fit subject and time to sweat is to be chosen.

preparation, and besides with what requisites, whilst we give the same Medicines, we may be able to prosecute the *Diaphoresis* apart from those other Intentions.

And indeed we take notice that sudorificks inwardly taken, seldom or never operate of their own accord, as Emeticks, Catharticks, or Diureticks, but rather there is always need of a Rule to actuate the Medicine, and to determinate it to that energie: Wherefore a Diaphoretick being given, presently the Patient is to be handled after that manner, that both the Pores of the Body may be opened, and that the Pulse of the Heart may be much inforced. For these ends he is to be kept either in Bed, or a Bath, or in the heat of a hot-house, or else exercised with a more quick or hard motion of the Body, which that they may the better succeed in stirring up of Sweat, both the most fit time and subject, as often as it is in our power, is to be chosen; to wit, when the Blood has obtained a laudable *Crisis* or not very malignant, then when it abounds with much serous humour, and when as to its Particles it is not too much confused or disturbed, but is apt to be easily unlocked; and to be separated and fused into parts: For in a bilious Temperament in a lean and dry constitution, in the midst of a burning Ague fit, when all things are disturbed and indigested; oftentimes Diaphoreticks prove in vain or to ill purpose. Moreover, as often as they may seem to be of use, it is not convenient to give any of them indifferently, but the condition of the Salts, and also appropriated Medicines are to be chosen, according to the various condition of the Blood, and the diverse manner of powers in it, now of this Element now of that. Concerning these with what choice, and in what kind of Forms they ought to be prescribed, we will speak in the following Section.

CHAP. II.

The Kinds and Forms of Diaphoreticks, also the Reasons of some of their Chymical Preparations.

The disposing of Diaphoretical Medicines.

And Forms.

Sudorifick Medicines, for as much as they are manifold and divers, and to be ordained in a various respect, are wont to be reduced into Classes; therefore I think good first of all to distinguish and recense them here, both as to the Form or manner of Constitution, and as to the Matter out of which they are made. Their most usual forms are 1. Powders, 2. Chymical Liquors, 3. Potions, 4. *Bolus*, 5. Diet Drinks. The matter of every one of these are either the integral parts of the whole mixture, or they are some elementary parts of some mixture resolved or loosened by Chymistry, and they are either more simple, *viz.* either spirituous or saline, which latter again are either volatile or fixed, or also acereous or nitrous; or lastly the sudorifick Particles so divided and separated by the Art of Chymistry, are Elementaries compounded among themselves, *viz.* spirituous Salines, or saline Sulphurs. Whilst we run through all these kinds in order, we will make ready for you the more select forms of prescriptions of every kind of matter.

1. which have for their basis the integral parts of the mixture.

1. Diaphoreticks whose Bases are the integral parts of the mixture, in which likewise a sharp or volatile Salt is most potent, oftentimes help to the provoking of Sweat for this reason, for as much as their Particles being admitted into the Blood, as they are immiscible and also indomitable or not to be overcome, they very much agitate and divide its Mass, and as it were draw it into small pieces, so that at length as the joynting together of the Blood being much laxated, and put into an effervescency or fermenting, together with the Particles of the Medicine,

to

to be cast forth by reason of their heterogeneity, the superfluous ferofities, and the recrements and Corruptions of the Blood are cast forth adooors, what are of this Rank are wont to be exhibited in the form of Pouder, *Bolus*, Potion and Diet-Drink, according to the following Forms of Prescriptions.

Part I.

Their Forms.

Take of the Powder of the Roots of *Contrayerva*, of Virginian Dragon Wort, of Butter-burr, of each ʒj, of Coccinel, of Saffron, of each ʒβ, make a Pouder, the Dose is ʒβ, with some fit Vehicle.

Take of the Pouder of Vipers ʒj, let it be given in a convenient Liquor.

Take of the Pouder of Toads prepared from ʒβ to ʒj.

When Diaphoreticks ought to excel in a singular Alchal Salt, or mixed with the former.

Take Oriental *Bezoar* ʒβ to ʒβ, let it be given in a spoonful of distilled Water or other Vehicle.

Take of Pouder of Claws Compounded ʒj to ʒβ, let it be given after the same manner. The Bezoartick Pouder is made after this manner.

Take of the Powder of the Roots of *Contrayerva*, of Crabs Claws simple of each ʒij, of Pearls, of both Corals, of the whitest Amber, of Crabs Eyes, of Harts Horn, of Crystal prepared of each ʒj, of the western Bezoar, of Lemnian Earth of each ʒβ, of the Cerufs of Antimony ʒij, of Coccinel ʒβ, Ambergrise ʒiβ, musk ʒβ, make a subtil Pouder, which may be formed into little round Pills with the gelly of the Skins of Vipers. The Dose ʒj to ʒj.

Take of the Pouder of this Bezoart ʒj, of Toads prepared vj gr. make a Pouder, let it be given in a spoonful of Treacle Water.

2. Boles whose *Basis* is the integral parts of the mixture are reduced into the form of a Confection, Extract, and Conserve.

Take of Mithridate ʒβ to ʒj, of the Bezoartick Pouder ʒj to ʒβ, of the Syrup of the Juice of Citrons what will suffice, make a *Bolus*; in the place of Mithridate may be put Treacle or *Diascordium* or Confection *Liberans* of *Hyacint*: also *Bezoar* powdered or the Pouder of the Roots of *Contrayerva* or, others such like may supply the place of the Bezoartick Pouder.

Take of the Extract of Treacle ʒβ to ʒj, of Bezoartick Pouder ʒj, make a *Bolus*.

Take Extract of *Carduus* ʒβ, of Bezoartick Pouder ʒj, Salt of Wormwood gr. xv, with what will suffice of the Syrup of the Juice of Citrons make a *Bolus*.

3. Proions whose *Bases* are the common Decoctions or Infusions and Tinctures of Vegetables.

Take of the Roots of Butter-bur ʒj, of the seeds of the same ʒij, the roots of condite *Eringo* ʒvj, of *Carduus* Seeds ʒij, let them be boyled in Spring Water ʒbj to ʒββ dissolve in the Colature of Mithridate ʒβ or ʒij, let it be taken warm in Bed.

After the like manner may be boyled the Leaves of *Carduus*, the Flowers of *Caltha* or of Camomile in as much posset Liquor as will suffice, of which give ʒvj or viij hot, by it self or with some Pouder, Confection or other Diaphoretick being added.

4. Various kinds of Diaphoretick Infusions, and Tinctures may be prepared by Extracting the Virtues of simple Vegetables and of Confections with wine Vinegar or distilled Water, which being afterwards strained, and clarified by settling, are given by themselves or added to other Liquors oftentimes with success. Hither ought to be referred Waters, Wines and Bezoartick Vinegars prepared by Infusion, the forms of which are every where to be found among Authors. Moreover the Tincture of Vegetables very Efficacious in a little dose are made after this manner.

Take of the Roots of *Contrayerva* ʒbj, bruised and put into a Matrace, pour to them of the Spirit of Wine ʒbiiij, let them digest till the Tincture be drawn forth, which strain, and let it be abstracted in *Balneo* to the Consistency of Hony. The first Spirit abstracted keep by it self from the rest, pour more to the residence, and lastly extract the Tincture whose Dose is in a fit Vehicle from ʒβ to ʒj.

Diet Drinks whose *Bases* are the Decoctions of Liquors, designed for the cure of the Venereal Disease and of other Chronical Affections deeply rooted in the Blood and Humours.

Part I.

For indeed a very intense and frequent sudation, viz. for a long time, is ordinarily required for the cure of some Diseases; to wit, that not only the impurities, and corruptions of the *Viscera* and the Humours may be purged forth, but that the morbidick Tinctures deeply impressed in them might be wholly blotted out, and as it were extracted. For this end it will not be enough to give now and then a sudorifick *Bolus*, but a whole Diet ought to be ordered for this purpose: wherefore let all the Drink be a Diaphoretick Decoction, after which Dose taken also in the morning, let a plentiful sweat be provoked further by the heat of a Bath or Stove. Then when as by this reason both the Pores of the Skin are unlocked, and that Nature also is inclined to sweating, the whole day besides by the use of the same Drink, the recrements of the Blood and nervous Juice should evaporate by a continual breathing forth. By this method not only the Pox is most safely and for the most part certainly cured, but also other Herculean or difficult Diseases are indeed happily healed.

Take of the shavings of *Lignum Sanctum* ℥iiij, of *Sarsaparilla* ℥vj, of *China* ℥ij, of all the Sanders of each ℥j, of shavings of Ivory and of Harts Horn of each ℥ss, of Antimony powdered and tyed up in a ragg ℥vj, let them be infused according to Art, and boyled in Spring Water ℔xvj till half be consumed: then strain it. To the remaining ingredients pour a like quantity of Water, make an infusion, and a decoction to the consummation of the third part, adding to it of Raisins of the Sun ℔j, of *Liquorish* ℥j, strain it, and let it be reserved for the ordinarie Drink.

In a bilous Temperament, and a more sharp and hot Blood, let the *Guaicum* be omitted, increasing the Quantity of *China* and *Sarsa*.

Diaphoreticks
easie to be got
ready.

Diaphoreticks which consist of the Integral parts of the whole mixture easily got for poor People are to be prescribed according to the following forms.

In malignant Feavours take of conserves of *Lajula* ℥j of *Mithridate* ℥iijss, mingle them, let it be taken drinking a draught of Posset Drink after it, with the Leaves of *Carduus* or of *Scordium*, or Cammomil, or Marigold Flowers boyled in it.

Take of the Powder of the Roots of the Virginian Serpentry ℥ss to ℥j, let it be given in a fit Vehicle, or take of the Powder of the Roots of Butter-bur ℥ after the same manner.

In ordinary Cases let there be given of the decoction of Grummel or *Milium Solis* or of Butter-bur Roots or of Virginian Serpentry, or of the Roots and Seeds of the great Bur. In the Venereal Disease a decoction of Saponary or Sope-wort or the shavings of Box and the like, which may serve instead of the Decoction of Woods of greater Price.

2. Forms of
Chymical Dia-
phoreticks.

2. Sudorifick Medicines prepared out of the Elementary parts of the mixture have for their Bases either a Spirit, or a Salt sometimes simple, sometimes combined with another Salt or with Sulphur. The spirituouse are prescribed according to these following Forms.

1. which have
for their ground
spiritual Parti-
cles.

1 The Spirit of Treacle Camphorated ℥ss to ℥j or ℥iijss, let it be given in a convenient Liquor. After the same manner many other Spirits stilled out of the Juices of Vegetables matured by Fermentation and appropriated to certain Diseases may be given to provoke Sweat when it is required. Of which sort are the Spirits of black Cherries, of Elder Berries and of Juniper Berries with many others. The Spirits of Harts Horn, of Soot, of Blood and the like ought rather to be ranked in the Class of Salts.

2. which have
spiritual Parti-
cles combined
with others.

2. Diaphoreticks, whose Bases are Spirits with other combined Elementarie Particles, are prescribed after this manner. Take of the simple mixture ℥j, let it be given in a convenient Vehicle. Hither are referred also what are of a Spirit with a fixed a Salt or Sulphur combined together. Of which sort are the Tinctures of the Salt of Tartar and of Antimony, the Dose of which is ℥j to ℥ij in some other Liquor. Moreover Distilled Waters, in which the spirituouse Particles are allayed or mixed with the Waters are wont oftentimes to be given to move Sweat with good success.

Distilled waters.

Take of the Roots of Butter-bur, of Valerian of each ℥ij, of Zedoary, *Contrayerva* Virgin. Serpentry of each ℥iijss, of the Flowers of Butter-bur ℥iiij, of Saffron ℥ij being all cut and brused pour to them of Spanish Wine ℔iiij, distil it according to Art, and let the whole Liquor be mixed. The Dose ℥iijss to ℥iij, or

or take of the Roots of *Angelica*, of *Imperatoria*, of each ʒiij , of Zedoary, of Enula Campana, of Poyson-resifter, of Gentian, of the lesser Galingal of each ʒj , of the tops of *Carduus*, of Rue, of *Angelica* of each Mij , of the middle Bark of an Ash ʒvj being cut and bruised, add to it of Mithridate, of Treacle *Andromach.* each ʒij , mingle them and pour upon them of the best wine ʒvj , of distilled Vinegar ʒij , distill them according to art, the dose is ʒiij .

The dose of the aforesaid Waters may be actuated by the addition of Chymical Liquors or Salts. These sort of Liquors indued with a wine Spirit, are chiefly and almost only convenient for old People, also for such as are indued with a more cold temperament, as for those that are obnoxious to the Palsie or the Dropfie; but in a hot Constitution, and when there is a heat of the *Viscera* or a feavourish Effervescencie of the Blood, for as much as they torrefie, and enkindle it too much, they are wont rather to hinder than to help.

Diaphoreticks whose *Basis* is saline, as they are of a various Nature viz. (according as the volatile fixed Acetous or Nitrous Salt exists) so they are of a divers use, and operation, hence it is that in some cases these are better, and in others those, or they are administred, as we have noted before to be in Diureticks.

2. whose Basis is Saline.

1. Fixed, and Volatile Salts are most convenient for those whose Blood very much abounds in a Serous Humour. Moreover when at any time the Juice watering both the *Viscera* and the Nervous stock turns into a soweriness, as it is wont to do in Dropsical and Cacochemical Persons and in those who are obnoxious to Convulsive Affections, those Medicines are given to provoke the *Ephidrosis* or sweating forth; for whilst that they meet with the acid saline Particles of the Humours, and are combined with them, they unlock the joyniting together of the Blood, and also by reason of an heterogeneous mixture agitate its Mass; hence that the Serosities may be more easily separated, and brought outward thorow the Pores of the Skin, they are prescribed in the form of a Ponder, Bolus and Liquor,

1. which are of a fixed or volatile Salt.

Take of the Flowers of Salt Armoniack ʒj , of mineral Crystal *gr.* xv, of Bezoartick Ponder ʒj , mingle them, and let it be given in a Spoonful of Sudorifick Water.

Their Forms.

Take of the Salt of Tartar ʒj , of the Cerufs of Antimony *gr.* 25, make a Ponder, let it be given after the same manner.

1. Pondera

Take of the Ponder of Bezoartick mineral ʒj to ʒʒ , of Gascoins Ponder ʒj , make a Ponder, let it be given in like manner.

Take of the Cerufs of Antimony ʒj to ʒʒ , of the Flowers of salt Armoniack ʒʒ , make a Ponder.

These may be given in the form of a Bole by mixing the aforesaid Doses with Treacle, Mithridate or Diascordium or with the Extract of *Carduus*, Gentian, or the like.

Bolus

Take of *Bezoarticum minerale* ʒj , of the Flowers of *Sal Armoniack* *gr.* vj, of Mithridate ʒʒ make a Bolus.

Take of the Salt of Harts Horn *gr.* viij, of Bezoartick Ponder *gr.* xv, of the extract of Treacle ʒj , make a Bolus or Pills iij.

3. If more convenient in a Liquid form. Take of the spirit of Harts Horn or of Soot or of salt Armoniack drops 15 to 20 in a little draught of Sudorifick Water from ʒij to ʒiij , let it be taken with governance.

Liquors

Take of *Sal Armoniack* Flowers ʒʒ , of the Salt of Tartar *gr.* 15 of sudorifick Water ʒiij , mingle them and make a draught.

3. Diaphoreticks, which have for their *Basis* nitrous Salt, are wont to help almost in the same Cases or those above made of fixed and volatile Salt; for as much as they destroy the Powers of the acid Salt, and so dispose the mission of the Blood, that whilst it ferments, its *Serum* and excrements may be more easily separated and sent away.

3. whose Basis is Salt Nitre.

Take of Crystal mineral ʒiij , of the Salt of Harts Horn or of Soot or of Vipers ʒj , mix them, the Dose ʒj to ʒʒ in some fit Vehicle.

Take of *Sal Prunella* ʒij , Bezoart mineral or cerufs of Antimony ʒj , make a Ponder the Dose ʒij to ʒj .

4. Diaphoreticks whose *Basis* is an acid Salt chiefly prevail against the Powers of fixed Salt, and Sulphur. When at any time the Mass of Blood becomes

4. whose Basis is an acid Salt

Part I.

too much shut up or bound fast by reason of the saline fixed Particles being combined with the sulphureous and terrestrial, that it will not easily let go its serosities to be sent away by sweat (as sometimes is wont to be in continual Fevers and the scorbutick affection) the acid Salt in the given Medicine meeting with a fixed salt in the Body, and snatching it into its embraces, takes away its wicked Combinations, and so unlocks the fermenting blood, and disposes it to an *Ephidrosis* of sweating disposition.

Powders.

Take of the spirit of Tartar $\mathfrak{z}\beta$ to $\mathfrak{z}\mathfrak{j}$, of sudorifick Water $\mathfrak{z}\mathfrak{i}\mathfrak{i}\mathfrak{j}$, of the flowers of *Sal Armoniack* $\mathfrak{z}\beta$, mingle them.

Take of the simple Mixture $\mathfrak{z}\beta$ to $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, let it be given in a spoonful of Treacle or Bezoartick Water.

Take of Bezoartick Vinegar $\mathfrak{z}\beta$ to $\mathfrak{z}\mathfrak{j}$, of *Carduus* water $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, of Plague $\mathfrak{z}\mathfrak{v}\mathfrak{j}$, mingle them, and make a draught.

Sulphureous Diaphoreticks.

5. Some things merely or for the most part sulphureous, are commonly ranked in the Class of Diaphoreticks. As for example, some natural Balsoms and others made, also chymical Oyls, and chiefly of *Guaicum*, Box, Camphor, Hartshorn, and Soot, also the resinous extract of the more ponderous Woods with many others, which although they effect little by themselves to the provoking of Sweat, yet being conjoined with other Salines, I think they may not be altogether unprofitable; for as much as in a frigid Constitution, and too phlegmatick, the sulphureous Salines do rarefy the too watry blood no less than the spirituous, and dispose it to be evaporated more freely.

Take of Opobalsom *gut. vj*, to *xij*. of Baulm water or ground Ivy $\mathfrak{z}\mathfrak{i}\mathfrak{i}\mathfrak{j}$, of Sudorifick Water $\mathfrak{z}\beta$, let it be taken every morning for many days for the provoking the *Ephidrosis* or evacuation by sweat. It is convenient for pthical people and for Ulcers in the Reins.

In like manner but in a greater Dose is given, the Peruvian Balsom, also the tincture of Tolutan Balsom, also drops of compounded Balsoms.

Pills.

Take of the Resine of *Guaicum* powder'd $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, of the chymical Oyl of the same $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, of Bezoartick Mineral, and Gum *Guaicum* of each $\mathfrak{z}\mathfrak{j}\beta$, of Peruvian Balsom what will suffice, make a mass for Pills, Dose $\mathfrak{z}\beta$ to $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, drinking after it a dose of sudorifick Water, of a decoction of Woods.

The preparation
of the Bezoar-
tick Mineral.

The Chymical Preparations of some Diaphoreticks, and the Reasons of them.

Bezoarticum Minerale.

Take of the rectified Butter of Antimony $\mathfrak{z}\mathfrak{i}\mathfrak{i}\mathfrak{j}$, pour to it by drops as much of the spirit of Nitre or Stygian Water: abstract it with the heat of Sand, pour it on again, adding of the same *Menstruum* anew $\mathfrak{z}\mathfrak{j}$, and then abstract it again repeating it three or four times. The matter being taken away and pulverized, let it be calcined for an hour in a Crucible, then let it be edulcorated by washing, and likewise by enflaming it three or four times with the spirit of Wine, the Dose $\mathfrak{z}\mathfrak{j}$ to $\mathfrak{z}\mathfrak{j}$.

The Reason of it.

It is worth our observation in this preparation, that, whilst these most sharp Liquors are put together presently their Salts meeting one another are strictly combined; in the mean time the sulphureous Particles, which abound in a great quantity, are wholly excluded, and being set at liberty fly away, and carrying away with them some saline little bodies, they stir up heat and (as if something were burnt in the Act) a very stinking fume; then these being gone away, the remaining Saline with some earthy Particles of the Antimony are more strictly combined, and at last having passed the fire, that the emetick Sulphur may wholly exhale and the corrosive prickles of the Salts be destroyed, they make a renowned Diaphoretick;

phoretick; for that the divers Salts of the Medicine, do meet with the salts of our Bodies, with which whilst they are united, the joynting together of the blood and humours are lax'd, that there may be a way opened for the going forth of the ferous superfluity; by the very like manner as when the spirit of Nitre being poured upon the butter of Antimony, (as also the filings of Steel put into *Aqua Fortis*) stirs up a great ebullition with heat, and a black fume; for as much as the sulphureous Particles, whilst the Salts are combined, fly away in heaps as it were from an inkindled fire. And that an actual flame is not here inkindled, the reason is because very many saline Particles ascend together with the sulphureous; from which these are on all sides separated, lest that they going close together they should flame forth.

Part I.

The *Bezoarticum minerale* may be more compendiously prepared after this manner. The Butter of Antimony being infused in Spring water, let it be precipitated into a white powder called *Mercurius Vita*: which being dried, let it be leisurely put to *Sal Nitre* fused in a Crucible, and suffer it to flow for a quarter of an hour. Afterwards it being soluted by the often affusion of Spring water on the Nitre, a white and fixed *Calx* will remain, which notwithstanding, although it be usurpt for a Diaphoretick, is far different from the Bezoartick Mineral, because in this, the salts of the *Menstrua*, by which the virtue of the Medicine very much depends, are almost quite washed away: yea that comes nearer to the nature of Cerufs of Antimony, or rather seems to be the same with it.

2. Antimonitum Diaphoreticum.

2. Diaphoretick Antimony.

Antimony twice or thrice calcined with an equal weight of Nitre, then being melted in a Crucible, either let it fuse for some time or a fire coal being flung into it so long as it makes a thundering noise, untill the Sulphur be wholly consumed, a *Calx* consisting almost only of Salt and Earth, and imbued with fiery Particles remains: which, when sweetned (as the manner is) by frequent ablution becomes a mere *Caput mortuum* or insipid earth. And although it hath the name of a Diaphoretick, yet I know not to which its of Particles to attribute this virtue, and we have often in vain expected such an effect from this Medicine. For the stopping the fluxions of the *Serum* or blood, it hath been often given with success, for that this Earth being deprived of its proper Salts; it imbibes (which perchance it meets within our Body) acid Salts; such an Energy *Crocus Martis* being prepared by a reverberating fire seems to obtain as we have elsewhere intimated.

The Reason of it.

The Cerufs of Antimony being prepared out of its purer part, to wit, the *Regulus* being calcined with Nitre, is only its *Calx* more pure, or less defecate. In whose preparation Tartar is added, because the *Regulus* is endued but with a little Sulphur (without which the Nitre will not flame) wherefore that the Calcination may be the better performed, there is need of the addition of Tartar which abounds with sulphureous Particles.

The Cerufs of Antimony.

3. The Flowers of Sal Armoniack.

3. The Flowers of Sal Armoniack.

Take of *Sal Armoniack* powder'd b^j. of the filings of Iron ℥xij , being beaten together and mixed, let them be distilled in a Retort with a wide neck with a reverberating fire increased by degrees: a yellowish Liquor, which is the spirit of the Salt, will drop forth into the Receiver, and the flowers will be sublimed partly in to the neck of the Retort and partly to its sides, which gathered together let them be kept in a glass, the dose is *gr. v* to *xv*.

This operation is performed by mixing *Sal Armoniack* with Colcothar washed, also with the *Calx* or salt of Tartar, their volatile Particles being freed from their bonds may easily ascend. Thirdly, that the Flowers, whilst they ascend, something of another concrete, to wit, of Steel, Copper, or salt of Tartar, being carryed with them, may be impregnated with its virtue. When this sublimation is performed with Iron, or the *Calx* of Tartar, from the *Caput mortuum* of either Tinctures are gotten of no contemptible use, with the spirit of Wine.

The variation of this preparation.

4. Spirit

Part I.

4. Spirits of Sal Armoniack.

4. The Spirit of Sal Armoniack.

Take of Tartar calcined with Nitre, and of Sal Armoniack, of each ℥iij, let them be pounded by themselves, and then mixed and put into a large Cucurbit, pouring thereon of Spring Water ℥vj or viij, and so distilled in a sand Furnace. The Spirit will ascend with the least heat, pure, and very penetrating without any tast of Fire: If you rectifie this in a deeper Cucurbit, the most pure volatile Salt will be sublimed into the Alembick.

The reason of the Process.

The Reason of this process is this, Salt Armoniack is made of a volatile Salt, out of Soot and Urine, and Sea Salt, all which when they are combined in the subliming, the saline volatile Particles, being wholly cast off from adhering to their wonted sulphureous, are so fixed to the Sea-saline Particles, and entred into such a condition, that they cannot fly away. But as soon as this bond is loosed, viz. when this compounded Salt being dissolved with the salt of Tartar in water, is intimately mingled, the Particles of the sea Salt do stick to the saline-fixed of the Tartar, and for that cause the volatile being dismissed from their embraces, and ready to fly, do most easily ascend: But that the Spirit being distilled from the Sal Armoniack, hath no stinking smell as the *Stagma* of Soot or Urine, the reason is, because in that composition the volatile Salt, by the intervention of the Sea Salt, is cast off with certain sulphureous Particles; which when Soot or Urine is distilled by themselves, stick pertinaciously to the volatile Salt, which may plainly appear by either of their stinking Smells: Then moreover, because the liquors still'd forth from those Concretes are at first limpid and clear, afterwards yellow, and at length become red and black and dark, viz. for that the sulphureous Particles being first subjugated by the saline and hidden, leifurely rising up, unfold themselves, and overcome the others.

The spirits of Sal Armoniack, also as the spirit of Harts Horn and others of that sort are cleared of their sulphureous Particles.

And by what Reason.

But that in the composition of Sal Armoniack, the Particles of the Sea Salt, of the Urine, and of the Soot, do drive away the sulphureous part, and fix the volatile Salt, also by this experiment (which the famous *Zuelferns* found out for the fixing of volatile Salt) it may manifestly appear: As for example sake.

Take of the volatile Salt of Vipers, Urine, or Harts Horn at your pleasure what you will; this being put into a streight Cucurbit and shut close at the Orifice, excepting a very little hole, drop in drop by drop the spirit of Sea Salt, to the height of two or three fingers breadth, until all the Salt be dissolved: Filter this solution, and draw it off in a Cucurbite to dryness, in the bottom will remain a Salt of a good Odor, somewhat sharp and of a saline tast; whose use is highly commended for many diseases. Besides this I have further experienced, to wit, that, if thou shouldst recover thy volatile Salt, you must put to this, salt of Tartar, and sublime them in a Vial, and the most pure volatile Salt will ascend. After this manner you may so rectifie the spirits of Soot, of Harts Horn, and of Blood, that their sulphur being wholly driven away, they may become more grateful and less corruptible Remedies.

How this spirit may be distilled with quick Lime and a lixivium of Ashes.

The spirit of Sal Armoniack also may be distilled by other means, viz. if at any time a solution of this Salt should be mixed with a *lixivium* of fixed Salt or of quick Lime in equal parts; for by these and perhaps by certain other means, whilst the particles of the Sea Salt do enter into new conjunctions, the former fly away. In like manner it is about the distillation of Urine, as is shewed in its proper place.

5. Spirit of Soot of Harts Horn, &c.

5. Spirit of Soot, Blood, Harts Horn, &c.

Take of ponderous soot of burnt wood, shining with a blackness like pitch, what will suffice, that may fill an earthen Retort above the middle; then a large recipient being made fit, let the distillation be performed by a reverberatory Fire increased by degrees to a moderate heat; shortly the spirit will ascend in a whitish fume, then a yellow Oyl with a volatile Salt, and lastly a blackish Oyl, let the Salt be collected by it self, the remaining Liquor being separated from the black Oyl by filtration, must be rectified by distilling it twice or thrice in *Balneo Marie* or in sand;

sand; also the volatil Salt being depurated by rectifying it in a deeper Cucurbit may be kept for use. The Dose of the Spirit from drops 12 to 20: Of the Salt, from gr. vj to xij or xv.

Part I.

Little pieces or scantlings of Harts Horn, may be distilled either after the same manner by a naked fire, or in a Glass Retort in a sand furnace: In like manner Spirits are drawn out of Skulls, Bones, and Blood, with a volatil Salt, and a stinking Oyl.

6. Spirits and Refinous Extracts of Guaicum, Box, and of other ponderous Woods.

6. Spirits of Guaicum, Box, and such like.

These sorts of Woods are deservedly ranked with Diaphoreticks, because sudoriferous Decoctions are chiefly prepared from them. Their Hydrotick or Sweat-causing virtue seems to consist both in a saline and sulphureous Principle; for that these bodies are abundantly full of Particles of either kind. Wherefore besides the common way of preparing by Infusion and Concoction, those active principles, to wit, of Salt and Sulphur are brought forth by themselves by a chymical preparation, and being reduced into peculiar Concretes, to wit, Spirit, Oyl, Refine, they make elegant pleasant and more efficacious Diaphoreticks.

1. Spirit and Oyl are gotten after this manner.

Take the dust of *Guaicum* ℥ij, distil it with the fire of a reverberatory, or in a sand Furnace with a strong heat; a sharp Liquor will come forth, and something acid, and a yellow Oyl and black: Lastly, separate this and rectifie the rest in a Cucurbit, you will have a clear spirit, and of a sharp odour, and also a yellow ponderous Oyl, which will subside in the bottom of the watrish Liquor. The Dose of the Spirit ʒʒ to ʒjʒ, of the Oyl gr. vj to xv in a convenient Vehicle.

Either Medicine is a Diaphoretick, and used with success in the Dropsie, Scurvy, and Venereal Disease, without doubt the saline part of this Concrete, which is partly in the *fluor* and partly volatil; constitutes together with the Phlegm a spirit so called, and the sulphureous part is the more pure yellow Oyl, which by reason of a portion of Salt adhering, is heavy and sinks down; yea certainly sulphureous Particles do stick close to the Spirit, or acid-biting *Stagma*, and therefore it always stinks, and quickly forsaking its limpidity, it degenerates into yellow and red. The black Oyl consists of Salt, and of a more thick sulphur that is mixed with a portion of Earth. In *Guaicum*, the saline Element as to the greatest part, is carried beyond a fixity into a state of flowing and of volatility; wherefore a *lixivium* of its Ashes shews but little of Salt. It is far otherwise with Tartar, whose saline Particles are some only in a flux, and state of volatility; many notwithstanding remain fixed.

The Reason of it.

7. Refine of *Guaicum* is gotten after the same manner as the Refine of Scammony or Jalap, to wit, the Tincture is extracted with the Spirit of Wine, then it is abstracted to the middle, and the water poured into a Cucurbit, the Refine will be precipitated in great plenty, which being dried up and powdered, it may be given from ʒj to ʒʒ, with other sudorificks in a solid form.

7. Refine of Guaicum.

It thence appears that this Refine is the sulphureous part of the *Guaicum*, because that after its extraction if you shall distil the remaining *Magma* or dregs in a Retort in hot sand, or with a naked fire, you will have Phlegm and an acid Liquor in its wonted proportion, but the Oyls will come forth in but a very little quantity only. Wherefore it may be lawfully concluded from the spagyric *Analysis* of this Wood, that the Chymical Elements, what and how many soever they be, as we formerly asserted elsewhere, are indeed mixed; and not (as some say) to be from experiment only apparently produced.

The Reason of it.

Part I.

8. Spirit of Tartar.

8. Spirit of Tartar.

Take of choice white Tartar and shining, washed and dried (or rather as *Zuelferus* prescribes, soluted and at one time crystallized) ℥iij, distil it in a Retort with a large Receiver, the Fire being increased by degrees, until the fumes do wholly cease: You will have Phlegm, Spirit, yellow and black Oyl. This last being separated, the remaining Liquor being put into a Glass Cucurbit, let it be rectified twice or thrice in hot sand, by extracting every time a third part only. The Dose is of the Spirit ʒβ to ʒj, of the Oyl ʒβ to ʒj, in a prepared Body, they move sweat sufficiently.

The reason of the Preparation.

This is no place for us to deliver fully the *Genesis* and *Analysis* of Tartar, worthy of much consideration: But that we may briefly touch upon its Anatomy, this Concrete consists of very much Salt, (whose Particles are very many in a state of fixity, and some in flowing, and of volatility) much Sulphur, a little Spirit and Phlegm, and moderate Earth. In the distillation the volatile Salt ascending with the Spirit, renders the Liquor somewhat biting and pricking; which moreover by reason of the plenty of fluid Salt and Sulphur, is a little acid and so notably stinks, that it can scarce get a good odor by any rectification. As to the contents of this extilled *Stagma*, it differs not much from the product of *Guaicum*, unless that the Spirit is less acid, and does not so readily dissolve Coral and shelly things; but there is a great difference between the dead Head of this and of that, because very little of fixed *Sal* is elixivated from the ashes of *Guaicum*, and very much of it from the *Calx* of the Tartar. The reason of which appears from what was said before.

CHAP III.

Of too great or depraved Diaphoresis or Sweating, and its Remedy.

AS our Life is in a continual flux, therefore as new things ought to be added and put to it, so old and out-worn things ought continually to be drawn and carried away from it: Wherefore that all superfluous and incongruous Particles whatsoever, may be perpetually moved away; there are manifold ways of departings and excretions; in the doing of which, however Nature oftentimes knows not a measure, and goes either on this side or beyond, that which is most commodious. How it behoveth us to correct or moderate those Evacuations, which leading inward from the circumference or exterior compass of the Body, do purge forth by a certain particular Sink, as often as they offend in excess or in defect, we have shewed above: The way of our method requires now, that we also shew a Remedy, if that at any time the *Diaphoresis* or evacuation by sweating, (which tending from the Centre towards the Circumference, is the chief general and diffusive Excretion) should be too much or depraved.

Excessive sweating is a frequent Affection.

And indeed that this sort of affection doth too often happen, is obvious enough to common observation; for that there is nothing more usual, than that those labouring with the Phthisick or Scurvy, and others that are hardly recovered out of long Fevers, yea some without any disease or evident *prophasis*, live obnoxious to alliduous, and oftentimes very great Sweats. Therefore concerning the *Ephidrosis* excessive, we will enquire first how many ways, and from what causes such an Evacuation may arise: Then we will shew what Remedies, and what kind

of

of a manner of Administrations are most convenient in every case of it.

As to the first of these; often and immoderate Sweating is sometimes a Symptom of some other present Disease; for this is familiar (as we said but now) in the Phthisick and Scurvie: the reason of which is this, to wit, that when the Blood being corrupted either by some impure Miasm, or having got an evil disposition, doth not rightly concoct and assimilate the nourishing Juice continually suffused into its Mass, it sifts out and casts forth adors by Sweat that do far degenerate, heaped up to a fulness together with other excrements.

The Cure of this Sudation depends wholly on the healing of the Disease whose Symptom it is; in the mean time concerning this as much as belongs to the manner of Living, a profitable and necessary Indication is taken from that Symptom, to wit, that when nightly and copious Sweats happen in those Diseases, a Diet should be prescribed altogether of light aliments, viz. milk Grewel, Barly Cream and such like, whose light and soft Particles the bloody Mass may bear, and not of Flesh, or stronger Meats.

2. An excessive *Ephidrosis* is sometimes an effect of another past and gone Disease, as when it succeeds long Fevours: for so it still happens that feavourish burnings do terminate in hydrotick Dews (as an hot Summer ends in a rainy Autumn) that scarce any one can recover from a long Disease with this indisposition remaining; which notwithstanding is moderate and easily to be cured in some, but in others more grievous, and not less infectious than the Disease whose offspring it was. I knew a young Man, who growing well after a quartan Ague of ten Months, when he began to want his Fitts, he daily melted into so profuse Sweats, that he was necessitated to change his Shirt and Sheets all wetted (as if they were dipped in Water) thrice every Night. By reason of this Evacuation continuing so for many Weeks, his Flesh so fell away, and his strength was so exhausted, that he was almost reduced to the dryness of a Skeleton. He, when he had used a long time various Remedies without any benefit, at length by the drinking Evening and Morning of Asses Milk, and his other diet being ordered of Cows Milk, grew well in a short time.

In such like Cases the Blood perpetually casting back its contents, and as it were vomiting them forth by the mouths of the Arteries, presently cast forth adors not only the Chyle suffused from the *Viscera*, but moreover sucking up again for its Food both the nervous Juice, and the Farciments or fillings up of the solid parts, by and by loathing all those together, with the nutritious Liquor, expells them by the Pores of the Skin.

The chief Cause of this Disease seems to consist in the dyscrasie and debilitie of the Blood; for as much as its Liquor like sower Milk is apt to be continually fused, and precipitated into serosities; wherefore both its proper meltings, and also the humours which are poured in from any other place that cannot indeed be assimilated, are forthwith separated, and when the Pores of the Skin are very open, are sent forth adors by *Diaphoresis* or sweating rather than by any other way of excretion. But that the Blood is disposed so into fusions or fluxes, for the most part the cause is the Dominion of the fluid or acid Salts (even as in sower Milk) in its Mass. But sometimes the nervous Juice degenerated into a sowerness is first and rather the fault, for by that reason its Acid Excrements being chewed over again in the Blood, do fuse its Mass, and precipitate it into serosities: further from such a cause we do Judge the *Diabetes* and the English Sweat so called (because it was here general) to have had their origin.

This kind of excessive *Ephidrosis* is not wont only to arise from the vitiated *Crisis* and fermentation of the Blood, but sometimes by reason of its depraved Enkindling. It hath been already shewn by what means the Blood breaks forth into Sweat feavourishly growing hot by reason of the excess of Sulphur. Moreover this Symptom sometimes follows no less by reason of the Defect of Sulphur: for when that the Blood being impoverished, and made more watry is less enkindled, therefore as often as it is urged into a more rapid motion by an acquired heat, or agitation of the Body, there will be a necessity that its serosities (because they cannot be consumed by heat, or insensibly exhaled) should be resolved into Sweat. Sulphur is wanting in the Blood either because it is consumed, as after long Feavours, or because it is not enough generated by reason of lack of Sustenance. We may observe this latter not only in many men who being strait-

Part I.

Sometimes it is a Symptom of another Disease.

2. When also it is an Effect.

A notable example of excessive Sweating.

The reason of it.

The cause of excessive Sweating.

Partly from the vitiated Crisis of the Blood.

Partly from its lack of Heat.

Part I.

ned for Food or using a Lenten Diet, presently fall into an *Ephidrosis* or sweating by a more quick running or walking, but remarkably in Beasts, who when they are fed with Grass or new Hay sweat very much, and quickly languish with any Labour.

Its Cure.

As to what belongs to the Cure, hidden *Ephidrosis* or Sweating by reason of the aforesaid Causes, and *Prophasis*—the Therapeutick Intentions are chiefly these three, viz, First to take away, or mend the Dyscrasie or evil Disposition or the Debilitates of the Humours. Secondly a little to bind up the too open Pores of the Skin. Thirdly to derive the *Serum* of the Blood and the watry Excrements towards the Reins.

1. The first Indication.

To take away the evil dispositions of the Humours.

Electuary.

1. The first of these is performed by these sort of Remedies which destroy the Powers of the acid Salt in the Blood or nervous Juice, also which may promote (if perchance it should be defective) the Exaltation of the Sulphur. For which ends, *Antiscorbutes*, *Chalibeates*, also Medicines indued with a volatile, nitrous and alchalisate Salt do ofteneft give help. We will shew you some forms of each of them.

Take of the Conserves of the Flowers of Chichorie, Fumitory of each ʒij of the Poulder of Ivorie, Harts Horn, prepared Coral of each ʒj , of Pearls ʒʒ , Species of *Diarrhodon Abbatis* ʒj , of *Lignum Aloes*, yellow Sanders and red Sanders each ʒʒ , of *Sal Prunella* ʒiiij with what will suffice of Syrup of Fumitory, make a Confection, let them take the quantity of a Walnut in the Evening, and first in the Morning, drinking after it of the following Julep or of the Distilled Water ʒiiij .

Julep.

A distilled water.

Take of Fumitory water, of simple Walnut water of each ʒvj , of Snales, of Worms, each ʒj , of Sugar ʒvj , mix them and make a Julep.

Take of the Tops of the Firr Tree, Tamarisk, Cypress of each Miiij , of Mirtle Mij, of Leaves of water Cresses, Brooklime, Liverwort, *St. Johns Wort*, Harts Tongue, Betony, of each Mij , of the exterior Rinds of 12 Orenge cut and brused: pour them into *Brunswick Beer* ʒbvij , distill it in ordinary Stills, mix the whole Liquor and sweeten it at your pleasure, the Dose is ʒiiij twice a day.

An Expression.

Take of the Leaves of Sowthistle, of water Cresses, Plantane, Brooklime, each Mij , being brused pour them into the aforesaid distilled Water ʒbj and make a strong expression, the Dose ʒiiij to iiij at nine a clock in the Morning and five in the afternoon.

Chalibeates.

According to this Method I am wont to prescribe in the failing of strength and nightly Sweats after long Fevours, but if these remedies help not, we then must come to *Chalibeates*.

Syrup.

Take of the Syrop of Steel ʒvj , let it be taken one Spoonful in the Morning and at 5 a Clock with the Water above prescribed ʒiiij .

A Poulder.

Take of the Poulder of Ivory, of Coral prepared each ʒij , of the *Crocus* of Steel, of the Salt of Steel, each ʒʒ , make a Poulder, the Dose ʒʒ , twice a day with the same distilled Water ʒiiij .

Tinctures.

Take of the Tincture of the Salt of Tartar ʒj , the Dose *gut.* 20 to 30 twice a day with distilled Water. After the same manner may be given Tincture of Coral, also Tincture gotten from Gumms and Balsams. Further in these cases the Spirit of Harts Horn, of Urine or Soot are oftentimes given with success.

The second Intention consists in the alteration of the Pores.

The second Intention for the Cure of excessive Sweating consisting in the due Constitution of the pores is performed for the most part only by Exterior Administrations; for which end are prescribed anoyntings of the whole Body with Oyles of Almonds, of Palm, Oyntments of Orenge Flowers and such like, yea Linnen dyed with these are worn. Sometimes Bathings in cold Water or in the River, and sometimes the change of the Air are convenient. As to the use of these (which is known commonly enough) we need not prescribe any particular Governance.

Of the Affection which is commonly called an Aptitude to catch Cold.

But here it seems very opportune, to speak a few Words of a certain Affection troublesome to Sweating or at least regarding the excessive or inordinate *Diaphoresis*. I have oftentimes observed some to have had the Pores of the Body (or the Organs of Transpiration) disposed in that manner that they are hurt by nothing more than by the unaccustomed Blast or Approach of the Air; in so much that when in good liking and well in flesh also as to Appetite, Sleep, and having

having the right strength of their Members, they seem sound or well, yet they were not able to bear naked the least Blast of Wind or Air, but presently there followed a great Perturbation of Spirits with a failing of all the Faculties and an indisposition of the whole Body; which kind of Irregularity so lightly Contracted they cannot either quickly or easily shake off, but hardly, and not but after a long time recover their former healthful Condition: Those proclive to this Dyspathy or Infirmary fear the Air more then others do Fire or Water. Hence some dare not go forth adooors, others living within a close Chamber suffer neither Door or Casement to be opened, and if by chance a little Breath of Air get in by some hidden chink, they presently feel it, and are hurt by it. I have known some from such a cause fixed for many Months in their Bed. I remember a Footman healthful and strong enough, who for above ten Years never went out of his Chamber, nor could be perswaded to it, nor hired at any rate to go forth: and when afterwards the House being on fire he was drawn out by force, he was very dangerously cast down by it for very many Months without any other hurt: others are affraid to stand or walk upon an Earthen Floor or Brick or Stone Pavement, for that they are wont thereby to contract great hurt very many other the like cases every where happen, to whom further this infelicity is added, that few commiserate those that are so affected, neither are they believed to be sick indeed but only in Imagination.

Part I.
its Description.

That we may a little therefore search into the nature of this Affection, we think that it is not for nothing that they complain, but without doubt they feel a certain pain or trouble in themselves inflicted by the received Cold, or by the altered manner of transpiration, but that it may appear what it is, and in what the reason of it consists, it behoveth us in the first place to consider, by what ordinary means the Particles of the ambient Air get into the Pores of our Skin, and affect the subjects of them, to wit, the Animal Spirits diffused every where over the Superficies of the Body. For indeed as they are of a certain ethereal disposition or Nature, these appear to be greatly refreshed, and to be stirred up into as it were a flattering Expansion by the neer of kin particles both of the Air and Light, whilst those come proportionate to them: and in like manner the Blood, whilst that it passes thorow in its Circuit, the exterior Border of the Body, exhales even there as in the *Præcordia* by the Mouths of the Arteries its Mists or Smokes, and receives by the gapings of the Veins the sulphureous Food for the sustaining its Flame. For these benefits both of the Blood and of the animal Spirits, the Pores of the Skin are conveniently made and ought to ly open in that manner, that the Particles of the Air and Light in a moderate plenty being somewhat refracted, and with a gentle sliding to, might strike the outmost Borders of the substance of either of them. For otherwise if there should be an impropportionate approach of the agent to this or that patient or to both together, presently perturbations arise in this, or that, or together in either part of the Soul. For if the out-dwelling Spirits are either weak, or infirm of themselves and quickly dissipable, or by reason of the Pores of the Skin lying too much open are exposed to the more sharp and naked air, it still comes to pass that they are forced upon every light occasion into flights and distractions; and for that cause Grievs, Convulsions or resolutions or unbindings are stirred up here and there, not only about the exterior parts of the Body; but sometimes, from taking Cold (as they use to say) a falling down of the whole Body (which is not quickly or easily raised up) succeeds. And indeed from thence the aforesaid inordinations about the *Diapnoe* do chiefly arise, for as much as the sensitive Soul, being either not strong or not munited enough, lyes too open to injuries of the external Air; and so is disturbed at its more strong approach in this or that part, or together in its whole *Hypostasis*, and is forced into irregularities not presently to be recovered. Further hence also the flammie part of the Soul is wont to be affected and moved, by consent no less then by its proper passion or Idiopathic because of an impropportionate incountring of Air. For that the Fibres, and nervous Branches being carried into Corrugations and Convulsions, the Sanguiferous Vessels twining about them are by them variously straitned, that for that reason the Blood is compelled into inordinate fluctuations. Moreover the bloody Mass by it self very much purges forth its evils both as to its inkindling, and also as to the disposition of its depraved transpiration.

Thereason is searched into.

By what means both the Blood and Spirits are affected by the encompassing Air.

Part 1.

From the above-
said Affection
Symptoms pro-
ceed.

ration. In respect of the former the vital flame growing about the superficies of the Body, is wont to be compelled by its more sharp or hard blowing into noddings and trepidations and various inequalities, which shake the whole Soul. Then it is commonly enough known that there is nothing more can endanger the mixture of the Blood than a vitiated *Diapnoe* or transpiration: for hence Fluxes, and precipitations in the Mass of its serosity arise, from which happen Catharrs, Coughs, Asthmatical, Nephritick, and Arthritick Paroxysms.

From these it will be ealie to draw forth the formal Reason and also the causes and cures of this Affection of which we now treat. For that any one may contract from cold, or from the incounting of the naked air any where in this or that member, pain, or numbness, or Palsy, it so comes to pass because the animal Spirits flowing among the membranous Fibres being struck and put to flight, are agitated into distractions: but if that more amply from such a cause the *Languor* of the whole body, and casting down of the strength do happen, not a private handful or Band of the Spirits but their whole *Hypostasis* or the intire sensitive Soul seems be stricken; which being stricken and so contracted into a lesser compass and made shorter, it sinks down within the Organs of the Body, and suffers its faculties to flag. Besides these, if that a tumor of a little continuance, or a *Phlegmon*, the Toothach, Cough, or Pleurisy, happen to any one unwarily exposed to the Air, or if cold, heat presently following, and feavourish burnings arise, it is a sign that the Blood is no less affected by the improporionate approach of the Air than the animal Spirits, and therefore its Liquor being disturbed in motion and enkindling is either disposed to feavourish Effervescencies, or being loosned in its mixture it is compelled into various fluxes and precipitations of the serous Juice. It would be an immense and tedious labour to describe here all the Affections or Diseases which owe their original to such a cause. Hence proceed the Headach, *Vertigo*, the sleepy Diseases, the Pose or stuffing of the Head, the Squinzy, the Inflammation of the eyes, Cough, Vomiting, Loosness, and abundance of other Diseases; in so much that the common people are wont to refer the evident causes almost of all Diseases to these two kinds, to wit, surfeiting and taking cold.

The Procatarxis or pre-disposition of the above-said Disease consists.

Hitherto we have described the formal Reason, and conjunct causes of depraved transpiration. As to what respects the *Procatarxis* or predisposition, for which some sooner than others are apt to catch cold, I say this consists in the vitiousness or default of the animal Spirits, or of the Blood, or of the Pores, of one of these, or of more together.

1: Partly in the Spirits.

The Animal Spirits are sometimes in the fault, because being weak they are not able to suffer any thing that is hard or sharp which may come to them from without, but presently at the approach of the naked Air they are thrown into flights and distractions, even as many after long sickness abhor to be in the open air, and as soon as they are exposed to the Sunbeams very often fall into relapses: further sometimes the Spirits incline this evil to sweatings, for as much they being degenerate and having gotten a sharp and unquiet Disposition, they are carried by every blast of Air into irregularities, wherefore those who by reason of the spirits being so disposed do become Hypochondriacal, also obnoxious to the Affection which we have described, are troubled with cold upon every light occasion.

2: Partly in the Blood.

2. The Blood disposes to an habitude of depraved transpiration for a twofold reason, viz. both in respect of its temperament and of its mixture. As to this latter, oftentimes the joynting together of the Blood is so lax and loose, that upon every small cause and chiefly by reason of the approach of a cold or moyst Air, it is cast into fluxions and precipitations of its serosities, in so much as those indued with such blood dare not go forth adooors at all, yea scarce look out. But the sanguineous Mass as to its temperament being often very hot and vaporous, exhales highly sharp and penetrative *Effluvias*; by which, whilst the Pores of the skin are too much unlock'd and laid open, both the spirits and the vital flame are exposed more than they ought to the injuries of the naked Air and Winds.

3: In the evil constitution of the Pores.

Thirdly, the evil constitution of the Pores produced by sickness or by other means, or also being natural and born so, very much inclines to that habit of depraved sweating. For if those passages being too open do almost always gape wide, the Blood and Spirits in the whole or in some parts are not enough defenced against the encounter of the external Air. Such an amplitude of Pores is natural, and bred in some, as those who are indued with soft and loose flesh, have their skin for the most

most part thin and very full of holes: besides it is wont to be frequently contracted by various accidents: after a sudorifick Diet long continued, also after frequent sweatings which use to break forth about the declinings of Fevours, the Pores of the skin being extended and laid wide open to the utmost for a long time, they afterwards continually gape, and almost always remain more open.

Part I.

This Disease although it doth not threaten Death, yet because it renders life very troublesome or altogether unprofitable, it highly deserves a Cure: for which endeavour the curatory Intentions are chiefly these three, viz. First that the Debilities, or dejections or impoverishments both of the Spirits and of the Blood may be cured. Secondly, that the Dyscrasies of either of them (if perchance there be any) may be taken away. Thirdly, that a due conformation of the Pores may be procured.

Its Cure.

The chief point of this Business lies about the first Intention, for as much as it respects the strengthening of the animal Spirits or the making larger of the whole sensitive Soul: But unless the Patients are perswaded to assume a certain Confidence, that they may go forth adooors to exercise their utmost strength, and to endeavour to accustom nature daily to more sharp and hard things, all Medicine will be in vain; wherefore there will need a plentiful way of living and alacrity no less than of Medicine, to wit, that the plenty of animal Spirits may be daily restored and increased, and moreover thereby made more firm for bolder attempts: for which end generous Wines with good fare moderately taken are very requisite. Further Studies and Cares (whereby the Soul may be depressed) being omitted, the time must be spent in leisure and recreations or moderate exercises. By such a way of living rightly instituted, as the animal Spirit is comforted, so the decay and impoverishment of the blood is restored.

1. The first Intention, a Corroboration of the Spirits.

For the same ends also these following Medicines may be profitably administered.

Take of the spirit of Amber, Armoniack, what will suffice, take gut. 15 to 20 in the evening and in the morning first, in a spoonful of the following distilled water drinking after it nine spoonfuls of the same.

Spirits.

Take of the leaves of Sage or Rosemary, Thyme, of Savory, of Marjoram, of Costmary of each M. iij, of the Roots of Angelica, of Imperatory of each ʒvj, of Zedoary, of Galingal the less, of the aromack Reed, of the Florentine Iris, of each ʒiʒ, of Cubebs ʒiʒ, of Nutmegs, Cloves, Cinamon, of each ʒj, of the outward Rind of twelve Oranges and of six Lemons, being cut and brused, put them into white Wine and Canary ʒiij, and distill them in common stills, let the whole Liquor be mixed and sweetned with refined Sugar. In the distilling, hang at the nose of the Still in a little bag Amber Grease ʒj, Musk ʒʒ.

A distilled water.

Take of the tincture of Antimony or of Tolutan Balsom ʒj, take of them gut. 15 to 20, in the morning about nine a clock and five in the afternoon, in a spoonful of the aforesaid prescribed water, drinking after it ʒiij of the same, or rather in the morning a draught of Tea or of Coffee or of Chocolate with Sage boyled in it.

Tinctures.

A little before dinner take a draught of Xeroeuse Wine.

When these have been for some time used and that it seem good to intermit them, take in their place these following.

In the place of the Spirits take a Dose of the following Electuary morning and evening with distilled Water or Viper Wine.

Take of wet candied Citron pill ʒiʒ, of candied Mirobalans ʒj, of Nutmeg and Ginger candied of each ʒʒ, of Confectio Hamech, Alchermes of each ʒiij, of prepared Pearls, red Coral prepared each ʒiʒ, with the syrop or the juice of Alchermes, make an Electuary.

Electuary.

Let him drink for his ordinary drink Medicated Ale made after the following manner, viz. put into a Vessel of four gallons this following Bag.

Physical Ale.

Take an old Cock half boyled, and cut into small Pieces, of Sage and Hartstongue dried, of each Mij, of Dates cut vj, of the shavings of Sassafras ʒij, being cut and brused mingle them, make up a little bag with them and put it into the Vessel after it has worked.

2. The second Intention undertaking the amendment of the Dyscrasies of the depraved dispositions of the Spirits, and blood, is performed by the same remedies which are convenient for the Hypochondriack and Melancholy Affections;

2. The second Intention the amending the humours.

Part 1.

3. The third intention, the alteration of the Pores. which is best performed by the change of the Air.

The third kind of sudation which is a Disease by it self.

A notable story of it.

The reason of it.

on; wherefore those prescriptions formerly deliver'd by us for the cure of those Affections may serve here.

3. Concerning the third Intention which appoints for the right conformation of the Pores of the skin as for its due cloathing air, fires and means of living, there is little left for a Physitian. For the deseased fearing themselves and their strength according to their own Imaginations, do so cloath themselves, shut themselves in their chamber as in a Cloyster, indulge themselves in a Bed or Fire, even as they are carried by their own *genius* harkning to no precepts of their Friends or of the Physitian. Whatsoever others counsel them about those things they reject, objecting their own experience and knowledge taken from what doth help and what doth hurt them. The means of Advice which I received from them, and is wont to help, is but one almost, that they change the Air and Soil, by which they do not seldom change also their mind. For although they are addicted to close houses or to a chamber, when as being carried to forrain parts they breath a more warm and serene air, it is scarce credible how soon they grow well. So much for perverse and depraved *Diaphoresis* or transpiration. The Theory of which Affection we have therefore shewed more fully because it hath been left untouched by others: now we will return from whence we have digressed to excessive *Diaphoresis* or sweating.

There remains yet a third species of this Affection, to wit, immoderate sweating, which is not as the former a Symptom or effect of another present or past Disease, but is a Disease of it self or beginning from it self, or is the Parent of a morbid Affection. To the first Rank especially belongs that pestilent sweating, in time past, general among our Countrymen, known thorow the whole World by the name of the English Sweat, into the reason of which we shall by and by search. But, that we say nothing here of the bloody, black, bluish, stinking, or sweet smelling Sweat, of all which mention is made by Authors worthy to be believed, (and some of which also have fallen under our observation) we often advertise that some without any manifest cause do fall into the habit of *Ephidrosis* or of sweating, and from thence that evacuation being increased daily sometimes grows immeasurable; in so much that the humidities of the whole Body seem to be poured forth by sweat. And indeed it is no wonder that this Affection being once begun should increase daily; for those sweating much or often are very thirsty, and for that reason drink hugely, and so the more they drink the more they sweat, so that these two are reciprocally the cause and effect by turns and so produce one another in a long Series. There is yet living in this Kingdom a noble Lady, famous now for many years for an immense or rather stupendious *Ephidrosis*, for that she does not only every night, moisten or thorowly wet her Linnen and Bedcloaths, but besides distills into a bason put under her thighs many ounces, yea according to common fame many pounds of mere Sweat; in the mean time there is a necessity by reason of continual thirst provoking thereto, to take more plentifully of liquid things, by which as strength is restored so the sweat is continued. I received the History of this admirable affection, both from many worthy of belief, and (although she did never consult me for the recovering of her health) from the sick Ladies own mouth. However she had taken Remedies from many Physicians, and had tryed divers ways of living and the Regiment of the six non-naturals, she had drunk almost all kinds of Waters, had tryed the Air of others Countries and especially of *France*, but for all that she could do, this notable Lady doth yet labour with this troublesome distillation. Although it will not be easy for me to shew the Reason of this case, I being ignorant of what hapned in the beginning, progress and alterations of this Disease. What was to be observed from things helpful or hurtful, and only seeing her once, speech was had of it only by the by: yet however it may be lawful to suspect that in this, as in other Instances of Nature, the *Serum* of the blood, being too apt to go away, leaving the passages thorow the Reins, Lymphæducts, Glandulas and other ordinary ways of excretion did affect this by the Pores of the skin occasionally begun, and afterwards facilitated by a certain habitude, and constantly to observe it; to which perhaps may be added that the potency of the fluid Salt in the Blood and the nervous Juice, might cause a continual fusion of the blood, and a more plentiful separation of the *Serum*. To the curing of this Disease, when it being confirmed by a continual habit, and the œconomy of Nature being wholly inverted by it, I know not whether any Remedy, or any Method of curing

curing would be profitable. And certainly nothing would be proposed by me if I should by chance speak to her about it. But if that great Remedy for a vitiated *Diapnoe* or Transpiration, to wit, change of air, should be repeated, they should not go any more into *France*, but into *Denmark* or *Sweedland*.

Part I.

It will be very apposite to this business to discourse a little of the English Sweat, sometimes past peculiar and very deadly to our Countrymen, both at home and abroad. But this Disease hath not been seen in an Age, and that an example of it hath been made known to us only by the writings of others, we shall not go about to raise any *Hypothesis* about its nature and causes, but after having described its History out of Authors only propose by way of commentary our conjectures.

Of the English Sweat.

The English Sweat began in the Year 1485 about the beginning of *August* and lasted to the end of *October*; and although *Sennertus* said that this evil was familiar and continual for 40 years one after another to this Region, yet our own Countrymen both Physicians, and Historians, who then lived or neer that time, have observed that it had perfect and great intervals, and that it returned only four times in the space of 66 years, viz. 1506, 1517, 1528, 1551, and that it raged scarce above six months at any time, and that there was always a very wet season going before it. But in some of those years in which it raged, it made every where great slaughters, that in some places, every time of its Reign the third part of men were found wanting. So great was its malignity that so soon as it invaded any City, it took away every day five or six hundred, and scarce one hundred of all the sick would escape. I think it good to insert here an example of the Disease compendiously and methodically described by *Sennertus*, and consonant to our own Authors. Those who were taken with this Disease, were presently dispatch'd without long languishing, a *Bubo*, Carbuncle, or Pimples, and grew weak in mind with a great *Languor* of strength with inquietness, palpitation of Heart, headach, frequent quick and unequal pulse, with great palpitation of the Heart; and also they flowed with abundance of sweat and perpetually, which ended not till the Disease was at an end which hapned within twenty four Hours. For those who would not be pleased with sweating, nor used Cordials, and who bore the heat more impatiently, and took cold, they all suddenly dyed within twenty four hours. Afterwards when the reason of this Disease became known that the sick were drawn to sweats, and did fortify themselves with Cordials, fewer died. *Sen. de feb. Lib 4. Cap 15.* Concerning its cure *Polidor Virgil* writes a little more accurately. After many experiment and observations taken from things helpful and hurtful to the sick, by use they found out the promptest Remedy for every one to be after this manner. If any one were taken with this sweat in the day time, he presently went to Bed with his cloaths on, if in the night and in Bed he then rested quiet, nor moved himself from the place till twenty four hours were past; in the mean time, he cover'd himself so with cloaths that the sweat might not be provoked, but that it might still forth of its own accord softly, he took no meat if he were able to fast so long nor any more of drink he was accustomed to, and that warm, than might be just enough to extinguish thirst, in this cure the chief thing was that he did beware of taking cold, or so much as to put his hand or foot out of the Bedcloaths for a little air, for to do it was deadly. Others added that in the whole twenty four hours space he was to abstain wholly from sleep. This Disease because it was wont in so short a space to terminate in Life or Death was called by the Physicians an *Ephemera* or Favour of a days space. Those who recovered from this pestilent Sweat, after they had sometime continued well, sometimes fell into it again, yea sometimes a third time.

The History of the Disease.

An example of the Disease out of Sennertus.

Its Cure described.

Out of Polidor Virgil.

That we may presume to deliver a Reason of this dire Affection from these *Phænomena*, let it first be lawful for us to suspect the formal Reason and also the conjunct Cause of this pestilent *Ephidrosis* to consist in this, that the Blood being infected with the meeting of a certain malignant or venomous matter, and for that cause being presently dissolved in its *Crafsis* and fused into serosities, therefore for the most quick expulsion of this virulent Mixture it is resolved into Sweat as the most universal and most ample manner of excretion; whereby indeed if perchance it hapned by this secretion that all the venomous Particles were presently driven forth adooors, the Disease presently terminated in health; or otherwise, very frequently in Death.

The Season of it inquired into.

But next to it ought to be inquired into whether this malignant matter is be-
got

Part I.

The primary
Cause.

In the nervous
Juice.

The reason of the
Symptoms.

From the like
case out of which
this Disease
springs, the un-
bloody Dysente-
ria and the
Diabetes arise.

got first in the Blood, or poured into it from some other place. If it be said the former it will be supposed, the Mass of Blood to have acquired an unquiet putrefactive *Diathefis* even as in the Plague by reason of a malignant Constitution of the Year and Air; which afterwards breaks forth either of its own accord, when it is brought to a plenitude, or by contagion, as it were enkindled into a dangerous and oftentimes corruptive Turgescencie, but I cannot suspect the business so in this malignant Sweat, as this in the first place shews that no signs of a corrupt or much vitiated Blood occur before in or after the Fit. For besides that this Feavour not very intense wants Spots, Pimples, Buboës and other Marks of an envenomed or very much fermenting Blood, moreover it is terminated in a Night and a Days space, which scarce ever is wont to happen in Diseases deeply radicated within the bloody Mass.

Wherefore I am rather led to believe the evil of this Disease to be primitively founded in the nervous Liquor, and from thence to be communicated to the Blood whilst it performs the Tragedy of that malignant *Ephidrosis*. For it seems that this Humour, watering all the Fibres of the whole Body, and being the Vehicle in all places of the animal Spirits, by reason of the intemperateness of the Year leaving its due *Crafsis*, to wit, a volatile saline Spirit degenerates into an acetous Nature, or some more vitious and at length malignant Disposition; and as this comes to that state of Depravation, then either of its own accord by reason of plenitude or excited by reason of the Ferment of Contagion, it conceives a turgescency or Flux being shaken forth from those irritated parts, and flowing back into the sanguineous Mass, it presently impoysons the whole, and dissolves its joyning, and by and by that it might be expelled it incites into that very great ecriticke Effervescency. Hence copious Sweats (because this is the next and most ample way of excretion) break forth; by which extream struggling of Nature if perchance it happens that the whole Poyson be sent forth again from the Blood into the habit of the Body, and thence cast forth every where by an universal, and for a while continual *Ephidrosis*, Health quickly shines forth as fair Weather after the Clouds are wholly dissipated; but if by that fermentation, and endeavour of Secretion into which the Blood is stirred up, for the sake of expelling the malignant *Miasma*, the venomous Particles are not suddenly and wholly cast forth, the Mass of Blood both in a manner deprived of the *Serum*, and undone in its *Crafsis*, not being able to be longer continued to a vital Flame, it vanishes.

From these it is not hard to give the reasons of its Empirical Cure and to assign the Causes of the Symptoms. For that the Disease being urgent, or about the beginning of its assault before the Feavour seems to be inkindled, presently an unwonted Languor, a defection of the Mind, an utter overthrow of strength, pain of the Head, Palpitation of the Heart, with a quick, frequent, and unequal pulse, and other affections of the nervous kind did infect the sick, it was a sign that the nervous Parts were affected before the Blood, and that from them that evil deduced its original.

2. As a more copious Sweat (which was sometimes both symptomatick and also critick) did arise about the beginning of the Feavour being otherwise in many others, the reason is, that the morbidick *Latex* or Water redounding from the Fibres and nervous Parts into the bloody Mass, for that cause it is presently at its first approach cast forth, nor suffered to stay any longer or to be intimately mingled with the Blood. For indeed in a state not very unhealthful, the nervous Liquor scarce ever agrees with the Blood: wherefore if at any time by certain turns that does flow back into this, it is by and by shook out again; and before it is infected with a lixivial Tincture being sent away by the Reins excites a flood of Limpid Urine, which we have informed you to happen indeed often in Convulsive Affections. But if the degenerate, or depraved nervous Liquor doth continually flow into the Blood, it produces sometimes the unbloody Dysentery, such as we have already described, sometimes the *Diabetes* as we formerly shewed. But by reason of the lesser and private restagnations of the same Humour, we have formerly shewed that cancrus, running, scirrhus, or knotty, and other Tumours of an evil kind do arise. But indeed in the Disease we now speak of, that nervous Liquor is truly so very malignant and pestilent that at the first touch it impoysons the Blood, and fuses it into serosities,

to be sent away quickly by Sweat; for otherwise if it were permitted to stay in the bloody Mass for a few Hours and to circulate and be thorowly mixed with it, it would wholly corrupt, and plainly mortifie it. Hence in that method of curing, there is so great Caution found by frequent experience, that from the first assault of the Disease, the Sick immediatly (not staying whilst their Cloathes may be pulled off and put into Bed) being covered with bed Cloathes are put to Sweat, and continue for 24 Hours an equal *Ephidrosis* excited in the whole Body, and are not suffered in the mean time to stir neither Hand nor Foot, nor to take food nor sleep; that is they may do nothing whereby that pestilent *Latex* may be any more, or intimately mixed with the Blood, or whereby its most quick and total exclusion might be hindered. That if this kind of quick plentiful and equal Sudation stirred up by the instinct of Nature, and regulated by Medicine may be so long continued, that the whole Poyson may exhale thorow the Pores of the Skin, the afflicted presently grow whole without any cutaneous breakings forth, gentle Feavour, long Infirmitie, nightly Sweats and other Consequences of Vitiated Blood. But for as much as the nervous Liquor after its corruptions so purged forth, is apt to be depraved again after the same manner, and so being moved by reason of plenitude or contagion to redound from the nervous Parts into the Blood and in like manner to impoyson it; therefore some after they have been perfectly well have usually been taken a second time, yea sometimes a third with the same Disease. There will be no need to add any forms of Medicines in this Case, because the whole business of the Cure, almost wholly depends on the right ordering or administering of the Sick. Besides it would be very impertinent to prescribe Physick, and a method against so unwonted a Disease which we hope will never return again, and if that it should ever return hereafter, it is uncertain whether the same way of curing ought to be observed in all things.

Part I.

Why those who
are recovered
from this Disease
are obnoxious to
fall into it a
gain.

Q

Sect.

Part I.

S E C T. VI.

C H A P. I.

Of Cardiack and Alexiterian Medicines or Cordials and Antidotes against Poyson.

Cordials and Antidotes against Poyson were always of common use.

IN ancient Medicine, and also in our yet Vulgar and Empirical, which old Wo- men and Quackfavers exercise, Medicines called Cordials and Antidotes against Poyson were always of most publick use and of a great Rank. The sim- ples of these are most numerous, their Compositions add to the heap, and almost fill all the Pages in all the Dispensatories both Ancient and Modern. But what has respect to the reasons of their Effects and the way of operating, viz. upon what kinds of Particles their Virtues depend, and by what affection either of the Heart, or Blood, or Spirits, or of the other Humours they exercise their Powers, concerning these I say, I find nothing said by Physitians or Philosophers which might at any time satisfy a Mind desirous of Truth. For the unfolding the Virtues of Cardiacks, they do not as in the other part of medicinal Cure insist upon the sensible and manifest Qualities, but they run to the Occult and Specifick, yea to the Actions of the whole substance; In the mean time if the thing be atten- tively considered, and the true and genuine Reasons of it be searched out, it will easily appear, that the notion it self of a Cardiack Remedy is very unfitly framed, and is but a vulgar Error.

Their vulgar Attributes.

The Cardiack Remedies are esteemed to be of that sort, which succour the Heart labouring after any manner of way; wherefore it is every where said in Authors these do notably comfort the Heart, that keeps the Heart unhurt from all putrefaction, yea others relieve the weak or oppressed Heart, Cure its faint- ing, or trembling, and preserve it from Corruption. Moreover because in the Pest, Small Pox, and malignant Fevours, it is believed that the Heart is cor- rupted or beset with Venom or malignity, therefore Remedies, which are wont to give help in those sicknesses, are not only called simply Cordials but *A- lexiterious* and *Alexipharmacas* that is Preservatives or Antidotes against Poy- sons.

From whence re- medies which defend life are called Cardi- acks.

This opinion both of Cardiack and Alexiterian Medicines, seems to have risen from thence, for as much as in times past it was thought and is commonly believ- ed, that the Heart is the beginning of all Life and Heat, and for that cause that our Life or Death depends upon its immediate Affection: Hence whatsoever things do refresh the Soul and make us lively and chearful, they are believed to do that, for as much as they are benign and friendly to the Heart; and on the contrary, others to induce sadness and melancholy, for as much as they are enemies and incon- gruous to the Heart.

These do not act properly on the Heart.

But indeed when as we have shown more largely elsewhere, that the Heart is not the subject of Life, but that it is chiefly and almost only the Blood, and that the Soul it self (upon whose existence and action of the Body, Life depends) is founded partly in the Blood and partly in the heap of animal Spirits, it easily fol- lows that the Remedies which conserve the Life whole, or restore it being in dan- ger, do respect these parts of the Soul, to wit, the Blood and the animal Spirits, rather and more immediately than the Heart: For this is not so noble and princi- pal an Inward as it hath been hitherto esteemed, but a mere Muscle consisting only of Flesh and Tendons, after the manner of the rest, and serving for the driving about of the Blood: But as often as it is deficient or wanting in rightly performing this Office, this is not its proper fault, but happens by the evil either of the Blood or animal Spirits by which it is actuated.

Therefore

Therefore that the reasons and manner of working of Medicines which are called Cordials may be known, it behoves us to consider these two things, viz. First, by how many or by which ways chiefly, the Blood being amiss as to its inkindling, or as to its mixture, and not seldom being in danger, requires helping Medicines, by which it may be preserved or amended. Secondly, by what means the Heart, by reason of a defect or fault in the animal Regiment, is hindred or perverted from its due motion, and wherefore Medicines which plentifully increase, and more rightly compose the Spirits, are prescribed.

Part I.
But in the Blood
and animal Spi-
rits.

As to the First, the Blood in respect of its accension either is deficient or exceeds; and in either respect divers manner of Medicines, to wit, hot or cold, as it were, Oyl or Water are required; and therefore they are commonly called Cordials, although they affect not at all the heart: For although from these being taken the motion of the Heart is oftentimes altered, and for that reason the Pulse becomes presently quicker or slower, stronger or weaker. Yet this is made so, because the motion of the Heart depending altogether upon the in-flowing of the animal Spirits (by a wonderful consent and cooperation between either part of the Soul) is exactly proportionated according to the accension or inkindling of the Blood: Wherefore as the Blood intends or enlarges, or remits or lessens by taken in Medicines its effervescency or heat; of a sudden the animal Spirits which agitate the Heart, observing exactly its condition, make the Heart to shake quicker or slower; and so if from the same Medicine a *sympsis* of the animal Spirits be effected, therefore also a greater or less strong or vehement Pulse is caused, when as in the mean time the virtue of that Medicine reaches no more to the Heart it self, than to the Hand or Foot or to any other Muscle: Therefore that the first class of Cardiacks whereby the enormities of the Blood are healed, may be instituted, it will behove us to weigh by how many, and by which ways its Liquor is wont to be perverted and depraved, both as to its accension and as to its *Crafsis*, then what kind of Remedies commonly esteemed Cardiacks, are required for every one of its evils.

How in the
Blood.

In the first place therefore, the Blood sometimes is not enough inkindled, nor is circulated with vigor, as is observed in many languid persons, to wit, such as linger with a long egritude, or such as have had great flowings of the Hemorrhoids, or other immoderate Evacuations, or broken with old Age; also in such who are very pale and cold in their extreme parts; with a weak Pulse and decayed strength. The Reason of which is, for that the Blood by reason of the sulphureous Particles being too much consumed or depressed, becomes almost vapid and decayed; and from thence is so very sparingly and finally inkindled in the Lungs: To which oftentimes is added, that the animal Regiment also flagging or growing weary; the Heart being destitute of a more full influx of Spirits, does not enough exagitate the Blood, whereby it might more lively ferment, and be inkindled.

The Blood offends
as to its accen-
sion and Crafsis.

1. When it is less
inkindled than
it ought to be.

The Remedies to be given in this case are generous Wines, Hot Waters, or more mild distilled with Spices, aromattick Powders, Species, and Confections, Chymical Oyls and Spirits, Tinctures, Elixirs, and other things endued with spirituous and sulphureous Particles, which do more agitate the Blood, and render it more inflammable and turgid; and as they together raise up and comfort the animal spirits; therefore they make the Heart to beat more lively and strongly. The Forms of these are set down at the end of this Chapter:

What Remedies
are prescribed.

Secondly, oftentimes the Blood by reason of sulphureous Particles, too much soluted and constrained into an effervescency; is inkindled more than it ought to be, and disperseth too strong an heat and very troublesome through the whole Body: Wherefore that it so very much rarefied and flaming forth, may be contained, and at the same time fanned within the Vessels, the Heart striking vehemently and swiftly, drives about the Blood with great labour and striving: Therefore in this case there ought to be administred cooling and temperate Cardiack Remedies, which may quench and allay the fervor of the Blood, and also gently refresh the animal Spirits whereby they may be able to be more strong to perform the present task of Life: To which ends are wont to be used distilled waters of Burrage, Balm, of Couflip Flowers, Marigolds, the Rinds of the whole Citron, also the Syrups and Conserves of the Flowers and Leaves of the same kind of Vegetables, the juices of Sorrel, Citrons, Oranges, mineral Crystal, and such like; to which Opiates are very often joyned with success; for the force of the Heart

2. What also
when too much
enkindled.

Part I.

2. The Blood of-
fending as to its
Crafs or mix-
ture, requires
only Cardiacks
in Fevers, and
then

It is either too
ftrict in its
joynting,

Or too loofe.

what Remedies
the latter Evil
requires.

Viz. Alexite-
rian.

How thefe defend
the Blood from
putrefaction.

being fomewhat reftained, the Blood more eafily and fooner remits its effervescency.

These are the more fimple Cardiacks, which are defigned to effect only one intention, to wit, the raifing up or the deprefling of the fanguineous Flame. But moreover the Blood is not only wont to be depraved and diverfly perverted as to its inkindling, but alfo as to its mixture or *Crafs*. But yet Cordials are not prefently required to all its dyscrasies, but only in thofe which being excited in Fevers when they are fudden and very great, do threaten a total corruption of the Mafs of Blood.

1. The Blood growing feverifhly hot, is indangered as to its *Crafs* chiefly two ways, to wit, either the band of its miffion is too ftrict, fo that all its Particles are complicated within themfelves, and are mutually combined fo as the unprofitable and excrementitious cannot be extricated or feparated from the profitable, and the thin from the thick; as happens in fome continual and putrid Fevers, which although they are little or nothing malignant, yet becaufe they are not able to be judged upon by fweat or tranfpiration, they fometimes are terminated in death: Wherefore in this cafe they are prefcribed for Cardiacks, which unlock and open this joynting together of the Blood, to the end that the ferous *Latex* with other recrements, may abfcende and be fent away from the concretion of the reft.

2. The *Crafs* of the Blood is befides in danger to be fubverted by another and quite contrary way in Fevers, and for that reafon other kind of Cardiack Remedies, viz. *Alexipharmacas* or *Alexiterians* are prefcribed: For truly it often happens that its joynting together is too much laxd, and as to its *Crafs*, torn afunder by heterogeneous Particles, either begot within its own proper bofom, or elfe poured in thither from fome other place, fo that the common bond of its miffion being loofened, it goes away every where into parts, and then portions of the coagulated or extravafated, and ftagnating Blood being fixed here and there, begin to putrefie and corrupt, and at length the whole fanguineous Liquor becomes fo much vitiated, that it is not fit any longer to continue the Flame, or for the animal Spirits diftilling into the Brain: Wherefore there will then be a neceffity for all its functions by degrees to flag, and laftly, Life to be deftroyed.

Cardiacks in this cafe moftly requifite, confift of thofe kind of Particles, which being carried into the Blood and circulated with it, are however untameable, yet benign: Wherefore whilft they enter into all the paffages and pores of the bloody Mafs, they every where agitate the other malignant Particles, pull them from their concretions, and at length either overcome them, or thruft them forth a doors. And fo, as the Blood being freed from that empoifoned mixtion, and alfo delivered from all the private Coagulations, is torn again into very fmall and elementary Particles, it recovers quickly its priftine and healthful mixture.

Indeed that it may better appear by what means *Alexiterians* do conferve the Blood and juices of our Body from peftiferous blafts, or defend them being already touched by them from putrefaction; it behoves us to fhew how other Liquors obnoxious to putrefaction, are preferved a long time, or being corrupted may be reftored again.

Therefore it is obferved of Beer, that it being apt of its own nature to grow fower, is made durable by the boyling therein the flowers of the Hop; yea, that common Water, when it otherwife quickly putrefies, being impregnated by the boyling or infufion of bitter Vegetables, (of which fort alfo *Alexipharmacks* are made) continues a long time uncorrupted: Befides that the juices of Herbs and fome other Liquors being already putrefied, if that they may be fumigated by the burning of Sulphur, will recover their priftine vigor. Moreover, that Wines, Beer, and other kinds of Drinks, being almoft vapid and dead; being anew ftirred by a fermentation within them do often revive: The reafon of which is, for that as the corruption of every thing confifts in the loofening of the elementary Particles and their going away one from another, whatfoever detains them, tending to flight and confufion, yet in motion and perfect mixture, preferves that Concrete whole and found. Further, if any thing in like manner compels together the Elements being loofened, and mutually about to go one from another, and ftirs them up into a new fermentation, it drives away putrefaction from the Concrete

Concrete although begun, and gives to it again a firm Constitution. These kind of alterations and preserving Liquors by art from Corruption, is known by every Plebeian; and indeed in the Plague and malignant diseases, Alexipharmacks seem to perform the same effect: For these being often taken, for as much as they continually agitate the Blood. and compel it into an higher fermentation, they conserve its mixture whole, notwithstanding the influences of the hurtful *miasmata*: Yea after the malignity being impressed, and the *Crisis* of the Blood after the aforesaid manner, being begun to be lax and loosened, these sort of Remedies being given even to a moving a *Diaphoresis*, for as much as they decoct the *Miasmata* of the received infection, and induce a new fermentation opposite to the other corrupt one, they oftentimes obliterate the impressions or the force of the pestiferous infection. The kinds and forms of these sort of Alexiterian Medicines, are set down hereafter.

In the mean time, as to what respects these other Cardiacs, by which the too strict joyning of the fermenting Blood is loosened and unlocked, for the sending away the feverish matter and other Excrements, that the vertues and means of the operating of these may be better known, what we have above said concerning the energies of Diureticks and Diaphoreticks, ought to be referred hither. For in truth, those Medicines are of a very near kin to some Cardiacs, yea are sometimes of common or reciprocal use, for as much as sometimes the vitiated *Crisis* of the Blood cannot be relieved, unless that first its joyning being unlocked, there be a way laid open for the sending away the serous water by the Reins or the Pores of the Skin. Salines do best of all perform every of these scopes of healing: For as we have oftentimes already noted, the opening of every Body both liquid and solid, is effected almost only with a saline Key.

What sort of Cardiacs are prescribed in the too close joyning of the Blood.

We have experimentally declared in the Chapter of the *Diuresis*, how by reason of the various infusions of Salts, the coagulation of Milk and its reduction from that state or inhibition are performed, and what analogy they have with the Blood; even as in Milk and in the fluid Blood, so likewise is it in fixed Metals, and other Minerals: For the Concretion or Compaction almost of every thing is from the salt of one kind, the dissolution by some of another, which snatches into its embraces the first Salt, and so a precipitation is made by some Salt of a diverse kind which destroys the combinations of the former. We have before declared these things so clearly and largely, that there will be no need to repeat them here. That therefore we have placed Salines in Cardiacs, no less than in Diureticks and Diaphoreticks, the same reason is for all: It now remains that we briefly shew what are the chief *species* which belong to that Rank or Cense of this kind, and the reasons and ways of their operating.

They are chiefly salines and of a diverse kind.

1. In the first place therefore, Cardiacs endued with a volatil Salt, offer themselves and carry away the palm from many others, as the spirits of Harts-horn, of Salt Armoniack, Compounds, viz. of Amber and Treacle distilled from the Roots of the *Virginian Serpentina*, and other Alexiterians, also what was the only and universal Medicine of a late Doctor, a Physician going over to the Empirical Sect, the spirits of dead mens Skulls dug out of their Graves. Hither also ought to be referred the Salt of Vipers, also the powder of Toads closely calcined, (which I knew very famous and beneficial formerly, in the epidemical pestilential Fever at Oxford in the Year 1643.) with many others. These sorts of Remedies have called back many from the very jaws of Death, and indeed they are often very beneficial in a diverse and manifold respect, viz. First, for as much as they open the mass of Blood, too much thickened and straitned by a feverish effervescency, by meeting with the fixed or acid Salts, and snatching them into their embraces; and so they promote a separation and excretion of the morbidick matter, both besides that they relieve the animal Spirits, and stir them up when slothful to the performing their duty. To which we may add, that these Medicines in malignant Fevers do overcome, and not rarely extinguish the venomous Particles of the morbidick Matter.

1. Cordials endued with a volatil Salt.

2. The second place among saline Cardiacs, ought in right to belong to Remedies endued with an Alchaliſate or petrifying Salt, for these are esteemed commonly famous Cordials. Of these sorts are the *Bezoar*, Stone, Pearls, Corals, the bone from the Heart of a Stag, the Horn of the same Beast, the powder of an Elephants Tooth, the Eyes and Claws of Crabs, and other stony and shelly Pow-

2. which are powerful in an Alchal or petrifying Salt.

ders,

Part I.

ders, which common Experience witnesses to be very often given with success: And the reason of the help seems to consist in this, that the Particles of the Alchal Salt in the Medicine, meet with the Particles of the acid Salt in our Bodies, and by and by they intimately joyn together, and so destroy their fiercenesses, and any other wicked combinations. To the class of these sort of Cardiacks also *Bolus Armenius*, Lemnian sealed Earth, and other Marls are deservedly ranked, not therefore however, that they succour (as the vulgar say) the sick Heart, but for as much as they destroy the powers of the acid or fixed Salt, either in the *Viscera* or in the mass of Blood, and presently allay or correct the enormities produced by them.

3. In a fluid or
acetous Salt.

3. If I should exclude from this Rank of Cardiacks acetous Medicines, or endued with a fluid Salt, the Authority almost almost of all Physicians, and especially of the Ancients, would rise up against me: For these for the most part are esteemed famous Alexiterians against the Pestilence. For the curing of malignant Fevers, Theriacal and Bezoartick Acetes are highly cryed up, yea Vinegar or acetous things are put into waters distilled for that use. For the same reason the spirits of Vitriol, the juices of Citrons, of Pomegranates, of Wood-forrel with many others of the same kind, are esteemed in the number of Cordials and *Alexipharmacons*; and indeed by good right, because these do best of all dissolve the combinations of the fixed Salt with the adust Sulphur, and overcome their fiercenesses; and therefore by these sort of Remedies, the coagulations and extravasations of the Blood that are wont to happen in malignant Fevers, are often prevented or cured.

4. In a fixed
Salt.

4. For the same or the like Reasons, by which the aforesaid salines, others also whose basis is a fixed Salt, are numbred with Cardiacks, or are put into their compositions: For that as divers sorts of Salts are begot in our Bodies, and that they pass every where from one state to another; hence it is that they ought to give for every intention, salines not of one but of a diverse kind. By what reason those endued with a fixed or lixivial Salt, take away or correct the enormities of the acid Salt reigning in the *Viscera* and the Blood, we have shown before.

5. In a nitrous
Salt.

5. Salt Nitre by good right is ranked with Cardiacks, seeing that without its Particles inspired with the Air the Life of Animals could not subsist: But this being taken inwardly at the Mouth is esteemed a famous *Antepyreticon*, for as much as it takes away the thirst, and greatly allays the feverish heat, which notwithstanding it effects, not only by helping the mission of the Blood but also its accension or enkindling. We have elsewhere shewed, that for the making of flame, together with the sulphureous Particles, nitrous are required, and by how much more plentiful they are, the more clear and bright it burns. Wherefore when the matter enkindled, which consists for the most part of Sulphur, with Salt and Earth mixed together sends forth but an obscure flame vitiated with Smoak and Soot, if that Nitre be cast in, it presently becomes splendid and temperate and shines forth with a brightness. In like maner we think it to be in Fevours when the Blood, being stuf with adust Feculencies, fumes forth with a suffocating heat, rather than openly flames forth, Particles of Nitre being taken in at the mouth, and carried into the blood, by and by make it to burn more clearly and is therefore beneficial or benign: to the end that the joynting of its liquor being more opened, its excrements both ferous and fuliginous may go away freely. Wherefore our *Verulamius* truly observes that the Particles of Nitre being carried into the Ventricle and also inspired together with the Air conduces very much to the maintaining and the prolonging of our Life.

These are the chief kinds of Cardiack Medicines, whose operation is chiefly upon the Mass of Blood, whose close or too strict joynting, and thickning by continual concoction, they somewhat fuse and open, that there may be a way opened for the morbidick matter: or they hinder the Blood from putrefaction being dissolved by an heterogeneous and malignant mixture, and broken into venomous portions and therefore obnoxious to stagnations, and corrupt Coagulations; for as much as the Particles of these Cardiack Alexiterions being carried into the Blood, and confused with it, in the circulating notwithstanding not being assimilated by it, or overcome, they every where rise against the venomous Particles, and either overcome them, or expel them forth adours; to the end that the bloody Mass being

ing freed from all malignity, and extricated from all coagulations, might quickly recover its pristine Disposition. Both these medicines for as much as they preserve the Blood from corruption, or extinction, are commonly called Cardiacks but may be more properly Vitals.

But if it be further inquired into, how these, or those being put into the Ventricle, without any notable action, or passion there stirred up, do so suddenly transfer their Energies almost unmixed into the bloody Mass: I say in the first place, that these Medicines, are by no means adverse or contrary, but very congruous or agreeable to the Animal Spirits; wherefore they do not irritate the nervous Fibres of the Ventricle neither into a sense of Grief, nor into excretory Motions; but rather provoke the Spirits inhabiting them into a certain Ovation or Complacency, by whose undulation presently the whole Soul is expanded. Then in the second place the passage from the Ventricle into the blood is not, as hath been formerly thought, so long, or is carried by so many *ambages* or turnings, and windings, that there should be any fear lest the virtue of the Medicine should be lost in the way; but in a moment is carried from the ends of these into those: For as we have observed above, innumerable sanguiferous Vessels thickly planted do cover the interior nervous Coat of the Ventricle, by which reason not only cathartick Medicines, but whatsoever others being destinated for the *Præcordia*, or the Brain, yea for the uttermost border of the Body, not being yet gone forth from the Ventricle, do begin their operations in the blood.

So much for Cardiacks so commonly called for that they restore the Blood being depraved as to its accension or mixture, to wit, either of them or both of them together, or reduce it to a better *Crafsis*. Whose operation and virtue, as it brings succours to the endangered Life; they (as we have hinted) rather may be more properly termed *Vitalia* or Vitals. But moreover some Medicines, that are known by the name of Cordials, for as much as they first and more immediately shew or exert their Energies upon the Animal Spirits, and so they erect, vigorate or compose either some portion, or the whole *Hypostasis* of the sensitive Soul being too much contracted, depressed or otherwise disturbed. And indeed these sorts of Remedies do as it were, although more remotely, affect the heart it self: For that when from these being given, the whole sensitive Soul is elevated, and more largely expanded; also the spirits destinated for the *præcordia*, do flow into them more plentifully, and actuate them more lively; and therefore the Pulse before weak and flagging, presently strikes more strongly, and the Blood is driven about with a greater force. These sort of Medicines being esteemed by a certain right for Cardiacks, do not much differ as to the matter from other Vitals, chiefly respecting the Blood: Yea some of them are common to either kind. As to the means of affecting these latter, may be aptly reduced to two heads, and for as much as they are either gentle or sharp, they follow the same scope, to wit, they either set up and confirm as it were by gentle stroking and soft handling the animal Spirits, or else by vexing them and urging them as it were with prickings or Goads, they compel them to more quick and sometimes to more regular motions,

The Cardiacks of the former kind as soon as they are entered into the Stomach, yea sometimes as soon as tasted in the Mouth, do put forth their Virtues, and with a grateful approach cherish the Spirits dwelling in the first passages, or as it were the Porch of the Body, or restore them; then by their continuity, the same rejoicing being delivered over successively to other Spirits, and from them to others, it presently waves thorough the whole chain of the Sensitive Soul; so that both the Brain and the *Præcordia* being irradiated by a more full influx of as it were rejoicing Spirits, they perform much more briskly and more cheerfully the duties of their Functions. For this end (having a care of a too great incitation of the Blood) they make waters commonly called Cordial Waters distilled with Wine or wine Spirits, and with Spices; also prepared with Musk and Amber Grise. Also Aromatick Pouders mixed with the same. Besides hither belong the magisteries of Corals, and Pearls, and Tinctures, also Elixirs, and very many others of the same kind breathing forth a grateful scent or odor: hence also sweet smells, and pleasant sights for as much as they recreate the animal Spirits are numbred among Cardiacks: for whatsoever doth gently affect and delight the Spirits presiding in every Sensory, doth by and by raise up and

Part I.

The aforesaid Remedies are rather to be called *vitals*.

How these being put into the Ventricle, do by and by operate upon the Blood.

2. The second kind of Cardiacks which refresh the Animal Spirits.

These are of a twofold kind.

1. Gentle stirrers of the Spirits.

which sort do stir up an effect either presently in the Viscera, or in the Sensitive.

amplifie

Part I.

or at length in
the compass of
the Brain.

amplifie the whole Soul. In the mean time, other Cardiacks of this Rank without any great affection of the Spirits placed in the entrance, yea the first passages and mains of Blood being almost unsaluted, are perceived to operate first within the compass of the Head: Of which sort are certain Cephalicks so called, which when as they are not grateful to the Palat or Ventricle, and do scarce ferment or stir the Blood; yet they illustrate the Brain, and sharpen and corroborate the animal Spirits dwelling in it. Of this kind seem to be Sage, Betony, Rosemary, Vervain, with many others.

2. Or these Cardiacks are asper
and irritating.

which compel the
Spirits as it
were by whip-
ping them into
order.

2. Certain other Medicaments and kinds of Administrations, (which are not undeservedly ranked among Cardiacks) do operate after a different manner, and for that reason bestow quite another help; to wit, these do not gently stroke the Animal Spirits, and make them to be equally expanded; but they rather irritate and compel them to run and be carried forth hither and thither for that end, when that they being before out of order and dispersed unequally; they abound in some places more thickly and in others more thinly; and therefore intermit or perversly perform certain Duties of their functions, and chiefly within the Brain or *Præcordia*: Then the best Remedy is that they be then disturbed, and more agitated by an ingrateful Medicine; wherefore they being stirred up by inflicted Stripes, as it were whipped, leave their former irregularities, and of their own accord return into regular orders: For so it is a usual thing in swoonings, Syncopes, Oppression or Convulsion of the Heart; yea almost in all other Irregularities, Languors, and Faintings away of the Spirits, to give Spirits of Harts Horn, Soot, *Sal Armoniack*, or the tincture of *Castor* or *Asa fœtida*, with other Liquors. These and the like, as volatil Salts and empyreumatick or strong smelling Chymical Oyls to put to the Nose, is expedient, as also in sudden defections of the Soul, to sprinkle cold water on the Face, to shake very much the Body, to pull the Nose, and sometimes to strike or buffet the Body, avails. These kind of Administrations bring help, for as much as they stir up or exuscitate the Animal Spirits oppressed or distracted, or doing some other thing besides their proper Office, and then command them being expanded, and as it were, set again into order, to their former Offices. But that some suppose that help to proceed from hence, for that the Blood being hindered somewhere in its course, and stagnating chiefly within the *præcordia*, brings forth the aforesaid affections, and is restored into motion by those Remedies and means of Administrations: I say, that the cause of those Affections and the Cure, depends only secondarily and mediately upon the Blood: But that firstly the stagnation of the Blood proceeds from the animal motion of the Heart being stopped, and that the impediments of that are not to be taken away, but by the restitution of this. The various kinds of Medicines esteemed for Cardiacks being now rehearsed, and their manner and ways of working on the Blood or Spirits, or both of them together, being (as I think) rightly drawn or designed, it yet rests that we put down some select Forms of them, appropriated by Physicians to every one of the aforesaid Intentions.

CHAP. II.

Kinds and Forms of Cardiacks.

BECAUSE we have distinguished Medicines commonly esteemed for Cardiacks into two kinds, viz. some which chiefly and more immediately affect the Blood, and others the animal Spirits; in their first rank we have placed those which are destinated for the regulating the enkindling of the Blood, which compel its too cold liquor and slow in motion to grow more hot, and being exalted or increased with more plenty of sulphureous Particles, more abundantly to be inkindled and to flame forth: Of which sort are brisk Wines, strong Waters, distilled Compositions, Spirits and Tinctures of Saffron, *Elixir Vitæ*, of *Quercetan*, the tincture of salt of Tartar, of Steel, and other things filled with Spirit and chiefly with plenty of Sulphur, of which sometimes these, sometimes those may be taken at the pleasure of every patient. As often as by reason of the Bloods being but little inkindled, and for that cause too much heaped up and almost standing still within the *præcordia*, a languor and weariness of Spirits, with a great oppression of the Heart do infest: in this case *Aqua mirabilis*, Clove, Cinamon, and Wormwood Waters, compounded with the Rinds of Oranges, and distilled with Wine, are convenient. To which is sometimes added a dose of some Spirit, *Elixir*, or Tincture.

i. cardiacks increasing the acension of the Blood.

But here is need of great caution, lest these kind of Cordials be so often indulged: For I have known many both men and women, by the often use of these to fall into this evil custom, that they were necessitated oftentimes in a day to drink a draught of strong Wine, Spirits, or of some strong Waters. Moreover their Doses (because Nature being little accustomed to extraordinaries, doth not long endure their Contents) daily to increase, and often to repeat; so that at length the Stomach was not able to suffer or digest any moderate thing, ever expecting stronger and hotter things: But some *Visceras* and especially the Liver, are so dried and roasted, that the Blood being wasted as to its provision, and depraved as to its *Crisis*, a morbidous *Cacoehymia* or shortning of Life follows thereupon.

The abuse of these is described.

Many and various are the occasions for which many people are brought into this most evil custom of sipping Cardiack Liquors: For besides sudden languishings stirred up perhaps, by great sorrow, cruel labour, immense Sweats, or sharp grief; moreover if at any time Aliments not agreeable; do bring a trouble or nauseousness to the Stomach, or by reason of a convulsive *Diathefis*, a *syncope* or insensibleness seems to threaten: Further, for many other causes it is a usual thing to take vinous Spirits or *Aqua vitæ*, though very improperly so called, then after such kind of Cordials being often taken, they begin to be agreeable and delightful, by every sup of them the mass of Blood being a little more enlarged and more inkindled, it causes the *Hypothesis* of the whole Soul to be amplified and invited into a certain rejoicing; which afterwards sinks down again, but the Soul mindful of that complacency and not content with its present condition, at length affects the same, and by and by looks earnestly for the same to be taken again: Wherefore for every trouble of the Body or Mind, as soon as the Spirits begin a little to flag, a draught of Cordial Waters is sought for to erect them presently, and if it be ready at hand it is drunk, and so by reason of often stretching forth the Sails of the Soul to no purpose, the fabrick of the Body as of a Ship, perishes and decays. Nor does this evil Custom grow in use with Gluttons and great drinkers only, but sometimes learned men and very fair and ingenious Women; by often sipping Spirits and strong Waters, whereby they might the better furnish and exhilarate the quickness of their mind, spoil and very often quite destroy their own health. There will be no need to add here any forms of these kind of Cardiacks, so well and commonly known, it seems enough to have here noted the abuse of them.

upon what occasions this is wont to grow customary.

Part I.

2. What do al-
lay the too great
enkindling of
the blood.

Julep.

Apozem.

Confection.

3. Cardiacks o-
pening the too
strict joyniting of
the blood whilst
that it ferments.

1. Of that kind
whose Basis is a
volatile Salt.

Spirits.

Powders.

2. whose Basis is
an Alcalisate Salt.

In Pleurifies
what are conven-
ient.

3. Nitrous Car-
diacks.

In the second Class of Cardiacks we have placed those which do somewhat allay the too great effervescency of the Blood, and do a little restrain and attemperate its immoderate burning; as distilled Waters, acid and nitrous things. &c.

Take of the water of Wood-sorrel, of whole Citrons, of Strawberries, of each ℥iij, of the syrup of the Juice of Citrons ℥j, of the powder of Pearls ℥j, make a Julep, the Dose is ℥ij, three or four times in a day.

Take of the water of Pippins or sweet smelling Apples, of Raspberries, of each ℥vj, of the syrup of Violets ℥j, of the spirit of Vitriol gut. 12, make a Julep.

Take of Spring water ℔jss, of the juice of Lemons ℥j, of Sugar ℥jss, make a Drink, of which take when you please ℥iij.

Take Grass Roots ℥iij, of candied Eringoes ℥vj, two Apples sliced (or of Corinthian Grapes ℥ij,) the shavings of Ivory and Hartshorn each ℥ij, of the leaves of Wood-sorrel Mj, boyl them in ℔iij of Spring water to ℔ij, add to the straining of *Sal Prunella* ℥iβ, of syrup of Violets ℥iβ, make an *Apozem*, the Dose is ℥iij or iij, thrice a day.

Take of the Conserves of red Roses Vitriolat. ℥iij, Spring water ℔ij, dissolve it in a close thing and warm, then strain it, the Dose is ℥iij, at pleasure.

Take of Conserve of *Oxyacant*. Rob of Raspberries, of each ℥iβ, of prepared Pearl ℥β, Confection Hyacinth ℥j, of syrup of the Juice of Citron what will suffice, make a Confection, the Dose is ℥β, thrice in a day.

The third class of Cardiacks furnishes these sort of Medicines, which being destinated against the evils of the fermenting Blood do unlock and open its strict joyniting together, whereby its superfluities may be separated and sent away. These as they are chiefly and almost only Salines, for the multiplicity of Particles of which they consist, they are also after a divers manner in the condition of Salts; as for the most part their Basis is either Volatile or Alchalisate, or acid, fixed or nitrous Salt. Some of whose forms we will here propose.

First Cardiacks indued with a volatile Salt are wont to be given profitably both in Fevers in respect of the Blood and also in swoonings and sudden languors in respect of the animal Spirits, according to the following prescriptions.

Take of the spirit of Hartshorn gut. 15 to 20, of Treacle water ℥ij, let it be given in a spoon drinking after it a draught of an appropriate Liquor: after the same manner may be given the spirits of Blood, of mens Sculls, of Soot or the spirit of *Sal Armoniack* compounded.

Take of the salt of Vipers ℥j, of Crystal Mineral ℥ij of the powder of Claws compounded ℥iβ, mingle it and make a powder, the Dose is ℥iβ to ℔ij, in a spoonful of cordial Julep, drinking after it a little draught of the same.

Take of the flowers of *Sal Armoniack* ℔β, of Bezoartick Mineral ℔j, make a powder to be given in a spoonful of proper Liquor.

Secondly they are chiefly noted by the name of Cordials with the vulgar whose Basis is an Alchalisate Salt or petrifying: as in the first place Oriental *Bezoar*, Pearls, Corals, and other stony and shelly Powders.

Take of Gascoins powder or of Claws compounded ℔j to ℥β, let it be given in a spoonful of cordial Julep, drinking after it of the same ℥ij.

Take of Oriental *Bezoar* gr. vj to xx, let it be given after the same manner.

Take of the powder and of the Claws and Eyes of Crabs of each ℥j, of Pearls and Corals both prepared of each ℔iij, both *Bezoars* of each ℥β, the best Bole Armeniack, Diaphoretick Gold each ℔ij, Bezoartick mineral ℥j, mingle them and make a cardiack Powder, Dose is ℔j to ℔ij, or ℥j, in a fit Vehicle,

These following are esteemed most proper in Pleurifies, for as much as by destroying the powers of the acid Salt they take away or hinder the coagulations and extravasations of the Blood.

Take of the powder of a wild Bores Tooth ℥β to ℥j, crystal Mineral ℔j, of the powder of the Flowers of Red Poppy ℔β: make a powder to be taken in any Liquor. After the same manner is given the powder of Crabs eyes, and of the jaws of the Pike fish.

Hither belong also preparations of Nitre which according to the following Forms, hath been often given in Fevers with success.

Take of Mineral Crystal ℔j, of the volatile Salt of Hartshorn gr. iij to vj, mingle them, make a Powder, let it be given in a spoonful of Cordial Julep.

Take

Take of Mineral Crystal, of Diaphoretick Antimony of each \mathfrak{Dj} , of Bezoartick Pouder $\mathfrak{D}\beta$, let it be given after the same manner.

4. Medicines whose *Basis* is a fluid or acid Salt, for the unlocking the jointing of the Blood in Fevours, are prescribed according to the following forms.

Take of the spirit of Vitriol *gut.* iiij to vj , of Cordial Water $\mathfrak{z}\text{iiij}$, of Treacle water $\mathfrak{z}\text{ij}$, of the syrup of the juice of Citrons $\mathfrak{z}\text{iiij}$, of Pearls $\mathfrak{D}\beta$, make a draught to be taken twice or thrice in a day. In the same manner may be taken the spirit of Salt of Nitre. For the same end the drink of Cherbet with Lemons dissolved in Spring water, also the divine drink of the Palm tree are convenient.

Take of the powder of Hartshorn calcined, or of Antimony Diaphoretick $\mathfrak{z}\text{iiij}$, spirit of Vitriol or of Salt $\mathfrak{z}\text{j}$. let them be brused together in a glass Mortar and dried, the Dose is \mathfrak{Dj} to $\mathfrak{z}\beta$, in a spoonful of Cordial Julep.

The fixed Salts or Ixivials of Herbs are often put into the compositions of *Alexipharmacons*. Besides Medicines whose *Basis* they are, for as much as they are noted, to be very famous *Febrifuges* or helpers in Fevours ought also to be numbred with Cardiacks.

Take of the salt of Wormwood \mathfrak{Dj} , of *Carduus* water $\mathfrak{z}\text{iiij}$, of the spirit of Vitriol or oyl of Sulphur \mathfrak{Dj} , of the syrup of Violets $\mathfrak{z}\text{iiij}$, make a draught to be taken two or three hours before the fit.

Take of the water of the whole Citron, of Wood-Sorrel each $\text{fb}\beta$, of the salt of Tartar $\mathfrak{z}\text{ij}\beta$, of the juice of Lemons $\mathfrak{z}\text{ij}$, of Sugar $\mathfrak{z}\beta$, mingle them, make a Julep, whose use is in irregular Fevours which have day by day sharp fits without shaking. The Dose is $\mathfrak{z}\text{iiij}$, twice in a day.

The last Class of Cardiacks, and indeed in some respect the chiefest, is due to *Alexiterians*, for as much as they are chiefly vitals. The Kinds and Forms of these are so numerous, that if I should recount every one or the chief of them only, this work would increase into a great volumn. And there are already of these sort of Medicines, extant both many & great Antidotaries; therefore we shall be very sparing concerning this matter. Seeing that *Alexiterians* are either Preservatory or Curatory; we will in the first place shew you some select Remedies to be administred to those yet in health, against the contagion of every pestilence or malignity, in the mean time letting alone what is wont to be prescribed about the cure and alteration of the ambient Air; then in the second place we shall give you the select forms of prescriptions to be used after the Contagion is taken.

Part I.

Cordials whose Basis is an acid Salt.

What abound in a fixed Salts

Alexiterian Cordials which hinder the jointing of the blood being too loose from putrefaction are either:

1. Preservatory Antidotes.

Preservatories.

Take of the Conserve of the leaves of Rue $\mathfrak{z}\text{iiij}$, of Mithridate and *Confect. Liberantis* of each $\mathfrak{z}\text{j}$, *Confect. de Hyacinth.* $\mathfrak{z}\text{ij}$, of the salt of Wormwood $\mathfrak{z}\text{ij}\beta$, of the powder of red Cloath $\mathfrak{z}\beta$, Bezoartick Vinegar what will suffice to make an Elect. the Dose the quantity of a Chestnut thrice a day.

Take of the Virginian Serpentry roots, of the roots of *Contrayerva*, and of *Zedoary* picked, of *Species Liberantis* of each $\mathfrak{z}\text{ij}$, of Camphir \mathfrak{Dj} , of Sugar dissolved in Bezoartick Vinegar and boyled to a consistency $\mathfrak{z}\text{vj}$, make thereof according to Art Tablets weighing $\mathfrak{z}\beta$, to be eaten one or two often in a day.

Take of the Roots of Virginian Serpentry $\mathfrak{z}\text{iiij}$, boyl them in Spring water fbiiij half away, to the straining add of the best Hony $\mathfrak{z}\text{ij}$, of Treacle *Andromach.* $\mathfrak{z}\text{j}$, dissolve it close and hot, and strain it, the Dose is ij or iiij spoonful three or four times a day.

Take of the Flowers of Sulphur $\mathfrak{z}\text{iiij}$, melt them in a Crucible, then put in by spoonfuls one after another, of the salt of Wormwood $\mathfrak{z}\text{iiij}$, mixing it together till the whole Mass grows red; then add to it the powder of Aloes, Mirrh, and *Olibanum*, of each $\mathfrak{z}\text{j}$, of Saffron $\mathfrak{z}\beta$, work them together for above a quarter of an hour until they be incorporated, the Mass being cooled and put on a glass Plate let it melt into a most fair Oyl like a Ruby to see to. The Dose is *gut.* 10 to 20 in Bezoartick water, $\mathfrak{z}\text{ij}\beta$ or ij , twice in a day.

Or put the spirit of Wine rectified upon the roots of Serpentry Virgin. and *Contrayerva* to the aforesaid Powder, to the height of three fingers breadth, let there be drawn forth a Tincture whose Dose is *gut.* 20 to 30 in a fit Vehicle.

Or take of the same powder $\mathfrak{z}\beta$, put to it of generous Wine fbij , dissolve it close

Part I.

2. Curatory.

close shut and warm, the Dose is on spoonful twice or thrice in a day.

After the Contagion is taken, and the *Crisis* of the Blood vitiated and beginning to be corrupted, the same sorts of Remedies but a greater dose and oftner are convenient to be given, yea both acetous things, and the fixed salts of herbs are very often added with success to *Alexipharmacaes*; by which the Coagulations of the blood are dissolved, and then all the heterogeneous Particles whatsoever being evaporated, and the others being constrained into a due mixture, its Liquor at length recovers and retains its ancient state and condition. For these end as there are extant every where innumerable forms of remedies in physical Books, I think fit only to set down here one or two.

Curatory Antidotes.

A Drink.

Take of Bezoartick water $\mathfrak{z}\text{ij}\beta$, of Bezoartick Vinegar $\mathfrak{z}\beta$, of Treacle *Andromach.* $\mathfrak{z}\text{j}$, mingle them by shaking them in a glass, make a draught, to be taken for provoking sweat.

Powders.

Take of Gascoins powder, of the powder of *Contrayerva*, Virginian Serpentry, of each $\mathfrak{D}\text{j}$ to *gr.* 25, make a powder, let it be given in a spoonful of Treacle water drinking after it a draught of the same or of a Cordial Julep.

Take of the powder of Tods prepared, of the powder of Claws compounded each $\mathfrak{z}\beta$, make a powder, give it after the same manner.

Bols.

Take of Bezoartick *Mineralis* $\mathfrak{z}\beta$, Treacle *Androm.* $\mathfrak{z}\text{j}$, of Camphir *gr.* vj, Bezoartick Vinegar what suffices, make a *Bolus* to be taken after the same manner.

Julep.

Take of the water of Angelica, *Carduus*, of Dragons each $\mathfrak{z}\text{iiij}$, of *Scordium* Compound $\mathfrak{z}\text{ij}$ of Bezarat. of Treacle each $\mathfrak{z}\text{j}$, of the powder of Pearls $\mathfrak{z}\text{j}$, of the syrup of Clove-gilliflowers (or of the Juice of Citrons) $\mathfrak{z}\text{ij}$, of the spirit of Vitriol *gut.* 12, make a Julep; the Dose $\mathfrak{z}\text{iiij}$, often in a day; sometimes by it self, sometimes with other Medicines.

CHAP. III.

Of Cardiack Passions and their Remedies:

Cardiack Passions are wont to be so called.

The trembling and the beating of the Heart.

The description of the latter.

The Reason of it searched into.

After the Cardiack Medicines so called, though improperly, follows to be handled the cardiack Passion, in which indeed the Heart labours and therefore truly requires cordial Remedies. Under this true name are commonly noted two Affections somewhat divers in themselves; to wit, the trembling of the Heart and its Palpitation: in either of which Affections the motion or inordinate pulse of the Heart seems to be in a manner convulsive: but yet the inordination of the former consists in the frequency of its Vibrations, and of the other in their vehemency. We will first search into the Reason of this latter, and then we will endeavour also to shew the knowledge of the other, and lastly the cure of them both.

The Palpitation of the Heart is sometimes so vehement and great, as not only manifestly to be perceived by touch, but also to be beheld by the eyes, yea sometimes may be heard at a certain distance. Moreover it hath been related by credible Authors, that by the more vehement vibration of the Heart and percussion of the Ribs they have sometimes been broken or in younger people driven forth and continued protuberous or sticking out.

But truly although this motion may be perceived by so many of the senses, yet it does not appear to reason what part is so moved, that it should make the left side of the Breast to leap out by every one of its strokes. I do believe that all both the

the learned and unskilful, will say with one consent that the part so moved and strongly shaken is the Heart it self; but I ask whether it be the whole frame of the Heart, or any part of it, that so leaps forth, and transgresses the wonted Sphear of its vibration? If it be said it is its whole Body that is so carried forth, I would have them say whether this is made in its *Systole* or *Diaſtole*. Certainly not the first, for whilst the heart is contracted, as may appear by inspection, its bigness as to all its parts is lessened; no more can it be said in *Diaſtole*, because in that state the Heart returns only to its ordinary and natural site and magnitude, and remains a little time in it. Hence seeing that according to the Laws of its vibration how strong or increased soever, the Heart cannot so palpitate, and leap forth; (which also further appears, because in a fevourish Fit when it beats most vehemently, it does not leap forth and strike the sides) I was once suspicious that during that affection it did obtain a convulsive motion, and quite contrary to its ordinary motion; whereby being agitated like a convulsive Member, the Heart was wholly elevated, and moved forth of its place. But the Neurology being more fully understood I presently fell from this opinion, because it is certain that the Heart can no ways be lifted up or carried forth, by any other Muscle, besides it own moving Fibres. Wherefore considering this thing more seriously, it at length came into my mind that whilst the Heart is contracted, for the excluding the Blood from its confines and that its tops and sides yeild on every side and are brought nearer; if notwithstanding all the blood be not forthwith wholly cast forth and sent away at every *Systole*, there will be a necessity for the roots of the Vessels filled to the hight and very much extended to leap forth with a certain force, then by reason of the verberation here made, the whole frame of the Heart to be greatly shaken.

Truly that this Affection doth arise from some such cause sometimes I have seen confirmed of late by an anatomical observation. A godly and known divine after that he had lived obnoxious to the palpitation of the Heart, at very many times now of its own accord now occasionally, he began at length to be afflicted with it continually night and day, with a grievous purfiness, and then within a few months being worn out with the assiduity of this most troublesome Disease, he dyed. His dead Body being opened, the right corner of his Heart appeared tumid with concreted blood, a little lap of which being hugely increased and extended contained great plenty of clotted blood. The Reason of these contents did presently appear, *viz.* because the Lungs being hugely obstructed and stuffed with black extravasated gore stagnating every where, were not able to admit of the blood continually to be thrust forth from the Ventricle: wherefore whilst the Heart highly labouring for its total exclusion is contracted inward towards the middle by every *Systole*, and as to its magnitude is diminished; its *Basis* by reason of the blood there heaped up and sticking or reverberating in its passage, being very much filled bunches forth, and because of the greatness of the Lap, or little Ear; being more tumid, shakes more largely and reaches to the side.

But indeed the Heart is seen to beat not only from this cause; because this Disease is not always constant and perpetual, but for the most being wandring, and uncertain infests at certain times, and then of its own accord or by the use of Remedies ceases. Besides it has hapned to some frequently whose Lungs are whole enough and free from any infection.

However although this Disease may arise from divers causes, yet we judge the same means of affecting to be even in them all. For it seems that the Heart only palpitates, for as much as whilst the Cone and sides being contracted together, it is straitned in its *Systole*, the *Basis* with the Roots of the Vessels being enlarged by reason of the blood there heaped up and sometimes adhering or repercussed, swells out or is tumefied. In truth from hence it appears that the course of the Blood in this place is somewhat hindered or beaten back, because whilst the Heart is vehemently and strongly shaken in the side, the Artery in the wrist for the most part beats languidly and weakly, as it were containing but a small River of Blood. Therefore as the conjunct cause or formal reason of this Disease, consists altogether in the stopping and aggestion of the Blood about the *Basis* of the Heart and Roots of the Vessels, it follows that we must inquire after how many ways and for what other causes this kind of affection is wont to be produced.

Concerning these as we do not lay the fault much on the Flesh or the proper moving Fibres of the Heart, this Evil chiefly seems to be imputed either to the

Part I.

It proceeds not from the Convulsive motion of the Heart it self.

It sometimes proceeds from the flux of the blood into the Arteries being hindered.

Besides it is wont to arise from other causes.

This affection for the most part depends upon the viscosity of the Blood or of the Vessels belonging to the Blood that.

Part I.

The reason of the former explained.

Blood or to the Vessels hanging to the Heart. The reason of the first is plain enough, for as much as those indued with a watry Blood or less apt to an effervescency or enkindling, as Virgins labouring with the green Sickness or chachectical men or women, are found for the most part obnoxious to this Disease, and are wont to be troubled with its assault constantly upon every the least quick motion of the Body. The cause of which is, for that the Blood consisting of sluggish and not active enough Particles, is not cast forth freely and expeditiously from the Bosoms of the Heart, but part of it oftentimes remains in them and easily stagnates: therefore as often as by the motion of the Body more plenty is brought into them that its whole provision cannot be cast forth by every *Systole*, the Heart labouring with mighty struggling drives it forth scarce beyond its *Basis* and the roots of the Vessels; where when it is heaped together, and remaining a little while, makes the parts containing it to bunch out, it causes the cardiack Passion together with a *Dyspnea* or shortness of Breath.

2. In the other case either the Vessels are obstructed or they are affected with a Convulsion.

An example of the former is proposed.

And diverse kinds noted.

How the palpitation of the Heart is a convulsive Affection.

For what use the many nerves are inserted into the Coats of the Arteries.

The Arteries being indued with moving Fibres.

Besides this cardiack affection does oftentimes infest some, notwithstanding they are indued with a very hot Blood and apt to be readily enough inkindled or to ferment. This evil is frequent and familiar with very many much troubled with the Hypochondriack, Hysterick, or otherwise convulsive Passion: wherefore in these cases we have deservedly suspected the Arteries belonging to the Heart to have been in the fault. By what means their obstruction hindring the free efflux of the Blood from the heart, causes the palpitation of the Heart, the History now recited manifestly declares: besides the shutting up of those Vessels, and infarctions or stuffings up being by other ways excited may produce the same effect. I knew an old Man accustomed for many years to the often drinking of stale strong Beer, and also of Wine, was wont to suffer frequent assaults of the aforesaid Disease; who dying afterwards with an ulcerous inflammation of the Stomach, with daily vomiting, with languor of Spirit, and other Symtoms; when I opened his dead body, I found the Trunk of the great Artery as soon as it was gone from the Heart to be bony or rather stony and its sides to be greatly compressed, that a chink only being left, not half the torrent of the Blood could flow that should do. So that I might very well ascribe the cardiack Passion so very troublesome to him to this cause. But it is probable this Affection does sometimes proceed from the Blood clotting within the Bosom of the Heart, and the adjoining Vessels, and being concreted as it were into a fleshy Crust.

But besides these, for as much as the cardiack Palpitation is wont oftentimes to be accompanied (as we but now intimated) with other convulsive Affections, we may suspect also that its cause is sometimes merely convulsive. We have formerly shewed out of anatomical observations in our Neurologie, the Nerves, and nervous Branches almost innumerable in very many places and chiefly neer the *Basis* of the Heart to be folded and wound about the Trunks of the Arteries; the Use and Actions of which we think to be of this Nature that the divers manner of Heats, Fluxes and Refluxes, yea sometimes Stagnations of the Blood that are wont to be excited by reason of the vehement affections of Anger, Fear, Joy, Sorrow, and such like, may so come to them, for as much as these little nervous Strings do variously strain, press together, or perhaps sometimes wholly shut up these sanguiferous Vessels. Besides it is not very improbable that by reason of those Vessels being convulsively affected, and a little longer constrained, so that they hinder the free exilition of the Blood from the Heart, the assaults of the cardiack Palpitation may arise. Indeed we may very well impute both this, and those other passions of the Heart to such a cause; but as to the means of doing it we a little seem to differ from that opinion. For after I had weighed more exactly the use and actions of the Nerves. I understood at length that they or their shoots did not draw or constrain anything at all, but that all this business was performed wholly by the fleshy Fibres, and that the nerves only do convey to these moving parts, new and abundance of Spirits, and also the instincts of approaching motions: which like kind of Office they performs towards the membranous Fibres for the business of Sensation.

Therefore whilst I did seriously search for what uses so many Nerves sowed thorough the Coats of the Vessels did serve, at length I found these Arteries by their own strength to contract and dilate themselves even like other *Præcordia*, and for the performing their motions both naturally and pathetically, both the plenty of Spi-

rits,

Part I.

rits, and the means of Instincts to be carried through those Nerves. For by anatomical observation it plainly appears that the middle Coat of every Arterie, is clearly muscularie, and through the whole consists of fleshy Fibres as those of the Ventricle, the Intestines, and some other *Visceras*, which ringy Fibres compassing about with a thick *Series*, as it were of small Hairs, the Pipe or Tube of the Arterie, do atchieve without doubt their proper *Systoles* and *Diafoles*, even as the Heart it self. Wherefore in the first place, whilst the Cardiac Fibres and then these Arterious, are successively, and one *Series* after another contracted, there is a necessity that the Blood should be rapidly driven along, from one bound to another. Wherefore it is not for nothing that some Physicians have attributed also a pulsifick Facultie to the Arteries: for that it is very improbable that the circuit of the Blood is performed by the impulse of the Heart as it were the stroke of a Bar. It is more likely by much that the Arterie in its whole passage being contracted as it were at the back of every sanguineous Flood, should urge it every where thorow those little smaller rivulets and more narrow spaces. According to this ordinary rite in equally driving about the Blood, the Arteries seem to have their constant turns of *Systoles* and *Diafoles*. Which although they are very swift, more quick than the twinkle of an Eye, yet they are made successively thorow all the parts of the Arterious Tube. But as we have noted that the equal course of the Blood is diversly broken off, and disturbed according to the force of assaults of the Passions, there will be a necessity that it is only so done for as much as the Arteries (by reason of an Instinct given through the Nerves to the moving Fibres) being suddenly constrained in divers places, they either stop, or repress, or drive to and fro more impetuously, the sanguineous Flood. In Fear, sudden Sorrow, Shame, Love and other Affections bringing in a consternation or great confusion of Mind, it is probable that the Trunk of the *Aorta* is so contracted and straitned by these Fibres suddenly and for some time drawn together, that the Blood very hardly and not but by very little Portions drops forth from the Bosome of the Heart. Wherefore from it there heaped up and stagnating, there is presently felt a mighty burthen, and a great oppression: then if to this stop of the Blood, a strong and vehement pulsation of the Heart for the casting forth of the Blood follows, it will be necessary by reason that the Blood being ejected at every *Systole* to the *Basis* of the Heart, and there repercussed, for those parts to be very much distended, and for that reason the cardiac Palpitation to be produced.

But as vehement Passions of the Mind do bring this affection almost upon every one, so Hypochondriacal Persons, and such as are convulsively disposed are subject to its assaults upon every light occasion, yea sometimes without any manifest cause. But in some the Splanchnick and Cardiac Nerves are wont often to be beset with a morbidick matter; so that it being moved by reason of plenitude or irritation, compells the Spirits inhabiting those parts, and neer about, frequently into Convulsions and inordinate Contractions; it still happens because that the Nerves being inserted in the Roots of the Cardiac Arteries from such a cause affected, also the Fibres of these Vessels being convulsively affected, and contracted therewith, by which means it is said to stir up the cardiac Palpitation. By what means the cardiac Nerves are irritated from a neer or remote cause, by a morbidick matter subsisting either in the Head neer to the Nervous beginning, or about the *Præcordia* or *Hypocondria*, and are carried into Convulsions or Cramps of divers Kinds, we have shown in some other place, from whence the causes of the Cardiac Palpitation may be deduced as often as the same shall be also Convulsive.

As to what belongs to the cure of this Disease, as the causes of it are various and manifold, a divers way of Cure also ought to be shown. For what some affirm that these Remedies commonly called Cordials do refresh the Heart, and are believed to bring help to it being sick, in some cases it is contrary both to reason and common experience to give them. Therefore as we have above declared that the palpitation of the Heart proceeds from the fault of the Blood or of the Arteries hanging to the Heart, and hinted the various means of either of these being affected, it now remains that we accommodate an apt method of Curing of every kind of this Disease, together with select Forms of Remedies.

1. In the first place therefore as often as this Disease proceeds from the default

Is moved like
other Muscles
and the Heart is
self.

And is often af-
fected with a
Convulsion or
Cramp.

From whence the
palpitation of
the Heart often
arises.

Wherefore this
affection is fa-
miliar to Hypo-
chondriacal per-
sons.

Its Cure is propo-
sed.

Part I.

what it ought to
be as often as the
fault is in the
Blood.

Electuary.

Julep.

Tincture.

Now this Af-
fection ought to
be handled pro-
ceeding from the
Arteries being
obstructed.

Medicines indu-
ed with a vola-
tile Salt.

Such as have an
acid Salt for
their Ground.

The Cure of the
Disease when
from the Arter-
ies convulsively
affected.

Spirits.

of the Blood, the primarie Therapeutick Intention will be to exalt to a better *Crasis* the too watery Blood being unable to be enkindled and to ferment, and to lift up and increase its active Principles being depressed or diminished; to which end spirituous Medicines, also salines of every kind, sulphureous and chiefly Chalybeate Medicines conduce, yea hither may be referred what are wont to be prescribed in the *Pica* or longing Disease, the *Leucophlegmacie* or Phlegmatick Dropsie and the colder *Scorbute*.

Take of the Conserves of the yellow Pontic Wormwood, of Orenge and Limons, of each $\mathfrak{z}\text{ij}$, of the Pouder of Winteran Bark $\mathfrak{z}\text{ij}$, of the *Species* of *Diacrycuma* $\mathfrak{z}\text{j}$, of Steel prepared with Sulphur $\mathfrak{z}\text{ij}$, of the Salt of Wormwood $\mathfrak{z}\text{ij}$, with what will suffice of the Syrop of the Rind of Citrons, make an Electuary. The Dose the quantity of a Nutmeg in the Morning and five a Clock in the after-noon, drinking after it of the following Julep $\mathfrak{z}\text{ij}$, and walking upon it.

Take of the water of the Leaves of Aristoloch, or Birthwort $\mathfrak{lb}\text{j}$, of Penroyal, of Hifop, of each $\mathfrak{z}\text{ij}$, of the Water of Earthworms, of Snails, and *Aq. Mirabilis* of each $\mathfrak{z}\text{j}$, of Sugar $\mathfrak{z}\text{j}$: mingle them and make a Julep.

Take of the Tincture of Antimony $\mathfrak{z}\text{j}$. The Dose is *gut.* 20 to 25 twice in a Day with the same Julep. Moreover hither may be ranked the Tincture of Steel, or the Syrop of the same, also the *Elixir proprietatis* with many others.

In the second place the Palpitation of the Heart, both oftner and much more crueller arises from the Cardiack Arteries being in fault: and then their Fault is either an obstruction or a Spasmodick Affection.

This first Disease is for the most part continual, and is often incurable; but especially if it be excited from tabid Lungs, or the Roots of the Arteries being compresed, or half filled by reason of some bony Tubercle or excrescency. which sort of cause if at any time they appear, and may be perfectly known, it were in vain to endeavour their taking away; but rather that it is only to bed one, that the life of the sick though miserable may be a little longer prolonged by some ease being procured by means of Hypnoticks.

But indeed it is not improbable (as we hinted but now) that the Arteries, sometimes from Polypous Concretions that are wont to be begotten there and sometimes within the Bosom of the Heart, are in a great part filled up; and for that cause the free and whole exilition of the Blood is hindered. But as we suppose the *Diagnosis* or thorow Knowledge of this very difficult, so likewise the Cure not less rare. When there is suspection of it, Saline Medicines seem to be of the greatest use; and of those, they that are indued with a Volatile or an Acid Salt are to be given: but not together, but those for some space (which not helping) then it will be necessary to try the others.

Take of the Spirit of *Sal Armoniack* Compound, *viz.* with *Millepedes* or with other Antasthmaticks or things good against the stoppings of the Lungs distilled $\mathfrak{z}\text{ij}$, the Dose is 15 Drops to 20, thrice in a Day with a Julep or proper distilled Water. After the same manner may be tryed the Spirits of Harts Horn, Soot, Blood or of mens Skulls.

Take of the Spirit of Sea Salt, or of Vitriol distilled with the Spirits of Wine impregnated with Pneumonick Herbs, and often Cohobated $\mathfrak{z}\text{ij}$, Dose *gut.* 15. to 20 after the same manner. For this use the Spirit of Tartar of the Woods *Guaicum* or Box.

3. The Palpitation of the Heart is most often a convulsive Affection, and is wont to be produced from the like cause and means of affecting as other Hypochondriack or althmatick affections. Whose Cure also ought to be endeavoured in like manner by antispasmodic Remedies or things good against Cramps or Convulsions. But the Choice of which is made with a certain difference, according as the Disease appears to be either of a Hot or Cold Temperament.

1. In respect of the former these following are prescribed. Take of the Spirits, Amber, Armoniack $\mathfrak{z}\text{ij}$, the Dose is *gut.* 15 to 20, twice in a Day with a Julep or proper distilled Water. After the same manner may be given at times the Tincture of Tartar, Steel, or Antimony.

Of the Trembling of the Heart.

Part I.

The Trembling of the Heart (which also commonly goes under the name of a Cardiac passion) is an affection distinct, yea divers from its Palpitation. For in it its own fleshy or moving Fibres seem to be affected by themselves, and not to subsist as in the other Affections, in a morbid cause in the Blood or in the Cardiac Arteries.

How the trembling of the Heart differs from its palpitation.

The Trembling of the Heart may be well described, that it is a Spasmodick Convulsion or rather a trepidation of its Flesh: by which the moving Fibres do most swiftly effect, but yet being but half contracted, quick, but broken and as it were but half turns of *Systoles* and *Diafoles*; so that the Blood can both be brought into, and also carried out of the Bosoms of the Heart, but only by very little Portions.

Its description.

Because that this Affection may be a convulsive motion of some Muscle, viz. of the Heart, to the more full Knowledge of it, what we have discoursed in another place concerning the Muscular Motion, and also concerning Convulsive Affections ought to be referred hither. That I may not seem tedious by repeating many things, in a Word know that every Muscle consists of two Tendons and a fleshy Belly; and that Contraction is from thence performed for as much as the Animal Spirits leap forth from either of the Tendinous Fibres into the fleshy, which whilst they blow up and intumesc, they therefore make short and render contractive; but the motion being ended, the Spirits return into the Tendons, and the fleshy Fibres are relaxed.

The reason of this depends upon the Doctrine of Myologie or knowledge of the Muscles.

The sum of which is delivered.

As the Motive Function is double, to wit, spontaneous and merely natural, in the former we say the Spirits are called forth by the government of the Appetite from the Tendons into the fleshy Fibres, and do remain within them in action till they are dismissed by its beck, but then being returned they remain quiet in the Tendons until they are again commanded forth, hence it is that their motion, and times of rest are unequal, uncertain, and variously to be determinated at our pleasure.

In the Function merely natural it is much otherwise; for that the Animal Spirits are carried forth from the Tendons into the Flesh by a perpetual turn or constant reciprocation, and a short contraction being made they presently leap back from these into those, and so vicissively; after which manner the Heart it self, the Arteries, and Organs of respiration, yea the fleshy Fibres of the Ventricle and Intestines, unless they are otherwise determinated by reason of their objects, are agitated by perpetual *Systoles* and *Diafoles*.

According to these ordinary means, the offices of the motive Function of either are performed, notwithstanding which they are wont to be diversly perverted or disturbed according as the Animal Spirits the performers of those motions are variously affected. For indeed it appears plain enough that the Instinct of every contractive motion coming from every muscle is conveyed by the Nerves from the Brain or the Cerebel or little Brain (in the hinder part of the Head) according to the command of the Appetite or the indigency of Nature; viz. The Animal Spirits abounding within their Pipes, being stirred up according to an Impression delivered from the Head, and moved in the whole Series, presently awaken others inhabiting the Tendons, and provoke them into proportionate motions, almost after the same manner as if any one should set fire of a Train of Gunpowder at a distance with a lighted Match. Therefore so long as those Spirits implanted both in the beginning, viz. Within the *ἐνκεφάλων*, and in the way, viz. the nervous Pipes, and in the end, viz. within the Tendons do keep rightly and orderly, they form, those convey, and these at length execute the instinct of every motion required by the Soul or Nature: but if the Spirits destinat-ed to the motive Function being unnaturally affected within any Dominion are compelled into irregularities, for that reason presently convulsive motions are excited in the members or respective muscles. By what means by reason of a morbid cause nigh the nervous Origin in the Head, by what also, by reason of that planted elsewhere within the nervous Pipes convulsive affections either of the members, or *Viscera* or *Præcordia* are wont to arise, we have in ar-

The convulsive motions of the Muscles are explicated.

And distinctly guided.

Part I.

Some private convulsions belonging only to the Muscles.

Two kinds of them set down.

nother place largely enough declared; viz. for that the Spirits flowing within the Nerves being irritated, and struck as it were with a certain fury from some preternatural cause, whilst they rush into these or those parts, and carry false and unjust signs of motions to be stirred up, there will be a necessity for contractions or violent and convulsive distentions in these or those Muscles, or Membranes to be caused, we have clearly shown the various kinds and formal reasons of these sort of affections in our *Spasmologie*; but what was there pretermitted, and belongs to the matter in hand we will now further advert, that we grant there are other kinds of Spasms or Cramps which do arise without any present or great fault of the *κεφαλὴν* or of the Nerves, by reason of the animal Spirits inhabiting the Tendons themselves being chiefly and almost only in the fault.

We meet with two observable kinds of this sort of singular and as it were private Affection: one is commonly enough known in which the spirits unbidden do often leap forth from the Tendons, and greatly and grievously blowing up the fleshy Fibres, do not presently or easily recede. The other, although less known, yet frequently happens in which the musculary Spirits are able to remain long, neither within the Tendons, nor within the flesh, but being highly unquiet, make out of these into this and back again in spight of Appetite or nature, their very often courses and recourses, but even weak and inordinate. Concerning these convulsive Affections (because they remain as yet untouched by most Physicians, and the knowledge of them makes very much for the truly unfolding the causes, and the nature of the cardiack Passion) I think it worth my labour here, although beyond the matter proposed, and as it were for Diversion however to set down a few things.

The former commonly called the Cramp explained.

This former Affection which is properly *τέτανος* (and both in our *Idiom* and the French is wont to be called the Cramp) for the most part arises, for that the animal Spirits unbidden do of their own accord leap forth from the Tendons from one or both together into the Belly of the Muscle, from whence they will not go back presently after their wonted manner, but staying longer within the fleshy parts do greatly inflate them, and render them highly contracted; then because others neither give place to these Muscles, nor conspire in Contraction, the part becomes still and stretched with exceeding great pain. The cause of this is, a certain Heterogeneous matter, and inflating, which descending thorow the nervous Pipes together with their Juice into the Muscles, and sticking to the Spirits, renders them Elastick and also obstinate; because that they cannot be contained within the tendinous Fibres, but desiring larger space they run forth into the fleshy parts, and there remain till their Tumour abates.

The latter is a leaping or trepidation of some Muscle.

Of which sort of Affection is the trembling of the Heart.

2. To this latter kind of convulsive motion properly belongs the Passion, or trembling of the Heart. Further to this Cense ought to be referred an affection commonly enough known and familiar to many, to wit, that sometimes they suffer a leaping, or very frequent and equal trepidations of some private Muscle: to wit, in the Lips, Cheeks, Eyes, or other Members; which after they have indured two or three minutes perhaps cease of their own accord. Not long since I was advised with by Letters from *France* concerning a certain Gentleman, all whose Muscles thorow his whole Body, did almost perpetually use such kind of leapings or trepidations, so that his outward Flesh every where leaping forth, imitated exactly the Vibrations of Pulses of the Heart it self.

Its formal reason.

The formal Reason of these kind of Affections, and as of the Cardiack trembling seems to consist in this, for that the animal Spirits belonging to some Muscles being unquiet, and as it were struck with a sudden fury, continually leap forth from the Tendons into the Flesh, and return, and iterate by a perpetual change their excursions and recursions; in the mean time as they are carried forth only with very small forces that they hardly fill the fleshy Fibres, and continue in them but a very little space only; although the motive endeavours be very often, yet they are but very weak and small; in so much as the Members, and Joynts are not moved out of their place by the so perpetually agitated Muscles, and the Heart during its tremor, how swiftly soever it be shaken, scarcely or not at all is able to drive about the Blood; as it plainly appears by the small and as it were trembling Pulse and failing of all strength.

The Causes.

As to what belongs to the cause of these Affections, viz. the conjunct, and more remote, by which the musculary Spirits are made so unstable, or acquire that

that desultorie force; it seems to be for that a certain Heterogeneous matter, and elastick coming from the Brain and nervous Passages, is carried at length into the Muscles and their tendinous ends; where growing with the Spirits from thence do greatly irritate them, and affect them as it were with a certain fury, so that they can stand still no where, but run about hither and thither, and in the mean time omit their due tasks, or not strenuously perform them.

The cause of the Cardiac Trembling is commonly cast upon the Spleen; for it is vulgarly supposed that from this *Viscus*, being obstructed or being otherways amiss, foul vapours are elevated to the Heart; which striking it compel it to be so shaken and to tremble, yea affect it with a certain rigor. Part I.

Faith to this opinion is confirmed or at least its probability, because Hypochondriack Persons (or what is almost the same, splenical) are found to be very obnoxious to this Cardiac passion. What and how much influence the Spleen has on the *præcordia*, we have already largely declared: From that and partly from what was but now said, it appears plain enough that this opinion, though much received, of the Heart being affected by vapours, is altogether false and erroneous. But that those who are esteemed splenetick and hysterick commonly, are still infected with the trembling of the Heart, The cause is, that great affinity and intimate communication, which the splanchnick Nerves have with the Cardiac, so that not only the affection of one part easily draws the other into consent, but if at any time a spasmodick matter falls upon the Branches of the Nerves, belonging to the Spleen or the *Viscera* of the lower Belly, it is very rare but that it possesses in like manner the Nerves belonging to the *Præcordia*.

What belongs to the reason of the Cure, to be shown in the trembling of the Heart; for that this Affection is merely Convulsive therefore not Cardiac, but rather cephalick Remedies, or for the Nerves, are prescribed; which notwithstanding ought to be according to the Temperament and Constitution of the Patient, and more hot or moderate, or now of this now of that nature. That I may comprehend the business in a few words, as in that Disease three kinds of Remedies are wont to be chiefly profitable, *viz.* testaceous or shelly, Chalybiats and such as are endued with a volatil Salt, we will here shew briefly some forms, and the use of every one of them. Therefore in the first place a provision being made by emptying of all, and a choice being had of the evacuation which might seem most useful, you may prescribe according to the following modes.

Take of prepared Coral, of Pearls, each $\mathfrak{z}\text{ij}$, of both *Bezoars*, of each $\mathfrak{z}\beta$, of the whitest Amber $\mathfrak{z}\text{ij}$, of Amber Grise $\mathfrak{z}\text{j}$, make a Powder: The Dose is $\mathfrak{z}\beta$ twice or thrice in a day, with some appropriate distilled water or Julep. Its Cure,

Take of the powder of Claws compounded $\mathfrak{z}\text{ij}$, of the powder of the Roots of Male Peony, of a humane skull prepared, of each $\mathfrak{z}\text{j}$, of the Flowers of Male Peony, of the Lillies of the Vallies, of each $\mathfrak{z}\beta$: Make a Powder to be taken after the same manner. Powders.

Take of Ivory, red Coral powdered, each iiij , of the species of *Diambra* or confection of Amber $\mathfrak{z}\text{j}$, of the whitest Sugar dissolved in what will suffice of water of *Napha*, and boyled to a consistency $\mathfrak{z}\text{vij}$: Make according to Art Tablets weighing $\mathfrak{z}\beta$, eat one or two often in a day at your pleasure. Tablets.

Take of the Conserves of the Lilly of the Vally $\mathfrak{z}\text{vj}$, of the powder of Coral prepared, of Pearls, Ivory, Crabs eyes, of each $\mathfrak{z}\text{ij}\beta$, of Vitriol of Steel $\mathfrak{z}\text{j}$, what will suffice of the Syrup of Coral, make an Electuary. The Dose $\mathfrak{z}\text{j}$ to $\mathfrak{z}\text{ij}$ twice in a day, drinking after it a draught of the following Julap. Electuary.

Take of the waters of Betony, Peony, of the whole Citron, each $\mathfrak{z}\text{vj}$, of the rinds of Oranges distilled with Wine $\mathfrak{z}\text{ij}$, of Sugar $\mathfrak{z}\text{j}$, make a Julep. Julep.

Take of our Syrup of Steel $\mathfrak{z}\text{vj}$, the Dose one spoonful in the morning, and at five a Clock in the Afternoon: With $\mathfrak{z}\text{ij}$ of the before prescribed Julep without Sugar or with distilled water. Syrup.

Take of the powder of Ivory, Coral, each $\mathfrak{z}\text{ij}\beta$, of the species of *Diambra* $\mathfrak{z}\text{j}$, of the salt of Steel $\mathfrak{z}\text{ij}$, of Sugar $\mathfrak{z}\text{vij}$, of Amber Grise dissolved $\mathfrak{z}\beta$: Make Tablets weighing $\mathfrak{z}\beta$, Dose $\mathfrak{z}\text{ij}$ or iiij twice a day. Tablets.

Take of fresh Strawberries lbviiij , of the outward peels of twelve Oranges, the filings of new Iron $\text{lb}\beta$, being all bruised together put them to Whitewine lbviiij , Distilled water.

Part I.

Spirits.
powders.

let them ferment in a close Pot for twenty four hours, then still it in an ordinary still.

Take of the spirit of Harts Horn, or of Blood or the like ʒiij , the Dose is twenty drops in some convenient Vehicle twice a day.

Take of the flowers of *Sal Armoniack*, of Coral prepared, each ʒij , the Dose ʒj twice a day.

Take of Crystal mineral ʒij , of the Salt of Amber ʒj , of the salt of Harts-Horn ʒj , mingle them : The Dose fifteen *gr.* to twenty, twice a day with distilled water.

Of the Intermittent Pulse.

The intermitting Pulse ought, and indeed deservedly, to be ranked with the Cardiac Passions, because in this affection or at least in some kind of it, the Heart it self labours, but in something a diverse manner than in its palpitation or trembling : For in these as to its motion it is amiss and irregular, in the other, as to its rest; for it is sometimes twice as long as it uses to be according to its ordinary course.

Two kinds of the
intermitting
Pulse.First, that
which is exci-
ted by the de-
fault of the
Aorta.

First, we ought to distinguish this affection, which (unless I am greatly deceived) hath two distinct ways of being made: For although sometimes the Pulse does intermit, because the Heart ceases for that time from motion; yet besides the Pulse being felt sometimes seems to intermit at the Wrist, whilst the Heart is perceived to shake (as it does in its trembling) most swiftly and incessantly in the Breast: The cause of which I suspect to be, for that this passion of the Heart urging a very little portion only of Blood, is cast forth at every *Systole* into the *Aorta*: Wherefore this being void and growing flaccid, and wanting its load to be moved away; lest it should act so often in vain, it sometimes intermits its contraction, and seems even as in the unloading of a Ship when the wares are more difficultly, and by some let for a time, staid in drawing them forth of the hold, the Porters that carry them are put besides or pretermitt some turns of going and coming. Further, in malignant or deadly Fevers, if at any time the Pulse be quicker and weak, it also then intermits, the reason of which is not that the Heart sometimes ceases from motion, (for then it mostly and incessantly labours) but for as much as the Blood is not carried with enough plentiful provision, by every *Systole* into the *Aorta*; wherefore this wanting work to do, sometimes grows idle.

The second which
proceeds from the
Heart it self.which does not
always betoken
Evil.Various Exam-
ples of it.

But moreover the Pulse sometime intermits, because the contraction of the Heart it self is suspended for a certain time, or its pause is twice longer, which indeed any one may easily find in himself or another, by putting his hand to the Breast, yea those who are sick as often as the Heart ceases from motion, may plainly perceive it in themselves, by the weight and oppression of the Breast. Moreover this affection does not so much happen to the languid, those about to dye, or that are dangerous sick, as to those well enough and as to many things in good order; wherefore it ought not always to be taken according to the opinion of the vulgar for a disease, or for a very pernicious or so hurtful a sign. These who are obnoxious to this, are wont to be troubled for the most part also with the *Verrigo*, the Headach or convulsive Affections. But this defect of the Heart as to its type is various, for now the periods of Intermision are certain, and determinated to a certain change of the Pulse, to wit, the third, fourth, fifth, or some other more often or more rare, now they are uncertain and wandering, as a cessation now happens after a few Pulses, by and by after more. The vibrations of the Artery whilst they are continued, are well and strong enough, and for the most part are equal, but yet sometimes the first Pulsation is the greatest after the intermission, that which succeeds a little lesser, and so by degrees they are lessened until the intermission comes again, then afterwards a great Pulse beginning, it descends again as it were by a ladder to a cessation.

I have known some (so much as the business could be made known to our observation) that were always endued with an intermitting Pulse, so that I never at any time touching the Artery could find it otherwise, and in the mean time they seemed well enough and complained of no sickness. But however I have known others

others also to have had an intermitting and more slow Pulse than ordinary, only when a cruel Headach or some more grievous Affection of the Head was present or neer at hand.

Part I.

From these I think it appears that the cause or formal Reason of the Affection, but now described, does not depend upon the mixture or *Crafsis* of the Blood, but only from the irregular dispensation of the animal Spirits from the Cerebel into the Cardiac Nerves, and from thence into the tendons of the Heart: For it may be well suspected that by reason of those Nerves being somewhat obstructed, the animal Spirits cannot descend to the tendons of this Muscle with a full Channel or influx: Wherefore as their provision is something deficient, the motion of the Heart ceases forthwith for one Pulse, until more plenty of Spirits being restored presently its action is continued: So we have seen a Mill driven about by a small Stream, the water sometimes falling and growing scant, to stop or go slowly for a little time, and presently when the water flowed or rose higher, to repeat its rotation or going round.

The Cause of the

Those whose Pulse is great of it self and strong enough, and is wont to intermit, are not only obnoxious to Head-aches and vertiginous Affections, but for the most part also to the *Incubus* and sometimes to the Apoplexy: For if it should happen that the Cardiac Nerves at first not enough open and fitted, should be afterwards wholly obstructed, there will be for that reason a necessity, the Heart (which is the first *Elatër*) being made immoveable, that the whole Machine of the animated Body, should presently cease from motion and consequently from Life.

The Prognosis

Although this affection having no present disturbance or danger requires not any hasty cure, yet for preservation sake, lest more grievous diseases should follow, Remedies and a certain Therapeutick Method ought to be prescribed, at least the means or way of living, as to the ordering all things rightly in the whole Life to come; yea a certain light course of Physick, to be observed yearly in the Spring and Autumn is wont to be prescribed, *viz.* that as much as may be all the morbid seminaries lying within the *ἐντέφalon*, or apt there to be begotten, may be taken away and be provided against. For this end we refer hither the prophylactick method with the Medicines by us elsewhere prescribed against the assaults of the Apoplexy.

What the Cure is.

The Anatomical Description of an Artery.

Since that we have shewn above that some Affections vulgarly accounted for Cardiac, do rather proceed from the Arteries being affected, than from the Heart; and that the inordinations of the Blood that are wont to be stirred up by the affections of the Mind, do arise by reason of those Vessels being irregularly contracted, therefore it seems worth the while and opportune, to add in this place a short anatomical description together with the uses and offices both of the Arteries in general, and chiefly of those which more immediately joyn to the Heart; and that the rather because as the more ancient Physicians did much dispute concerning these Vessels, the latter attributing the whole Business of the circulation of the Blood almost to the Heart alone, for as much as it is a Muscle, they have been but little solicitous about the Arteries.

First therefore, that I may remember what the Ancients have said, *Galen lib. 7. Administ. Anatom. Chap. 5.* says, That every Artery consists of a double Coat, to which (he says) the third and fourth may be added. Again *lib. 3. de Facult. Naturalibus Chap. 11.* He says that the Arteries have Coats like the Ventricle, and that the interior Coat has long and oblique Fibres, but the exterior transversal Fibres. I will in a few words shew, which way and how congruously this agrees with our anatomical observation.

The Coats of an Artery according to Galen.

For the right knowledge of this Experiment, take a portion of the great Artery or *Aorta* of a Man or Beast cut off, which being put upon a stick (whereby it may be stretched forth) dip it oftentimes in scalding water, that the Coats and Fibres being something contracted and made more tumid, may be better perceived and pulled one from another, then a separation being made by a Penknife, four distinct Coats will appear. The outmost of these thin and nervous, serving for

The preparation for its Anatomy.

It hath four Coats: a cover

Part I.

The description
of the outmost.

a cover of the whole Vessel, hath outwardly many nervous branches variously creeping about here and there, but in the exterior superficies a texture, as it were of the form of a Net, and very thickly planted of all kind of Vessels, and especially of the sanguiferous, covers the whole. The Arteries ascending every where in this Coat, first from the coronary Vessels, and then out of the Trunk of the *Aorta* and from its branches are ramified or branched with Veins and Branches in like manner, sent forth from its hollow. Moreover, the nervous Branches meeting with both these are variously complicated, and so of all these interwoven is made as it were a certain Net every where covering the Arterious Tube; from which very small furculs or little shoots of every kind of Vessels, shoot forth into the other underlying Coats of the Artery.

The second Glandulous.

2. To this retiform Coat another glandulous succeeds, or rather that sticks close to this placed upon it. This membrane being planted through the whole with very little and whitish Glandula's, is after the same manner as the interior glandulous Coat of the Ventricle and Intestines lying under the hairy Crust, also from the back of which a retiform or Net work enfolding of Vessels is every where disposed.

The third is Fibrous and muscular.

3. In the third place it hath a muscular or fibrated Coat, viz. contexted or woven thickly with accumulated transverse or annular Fibres. These fleshy and moving Fibres, compassing the Arterious Tube are not scattered by a thin and singular series, as in the Veiny Coat, but in a certain heap, some lying upon others, they make a very thick Skin. Their rows or orders being scalded in the Artery, may be very easily separated and pulled one from another, which in like manner seem (as those of the Ventricle and Intestines above described by us) altogether fleshy and moving.

The fourth nervous has right Fibres.

The fourth and interior Coat of the Artery, investing its Cavity and covering the underlying Coat, is thin and almost wholly membranous: Its little nervous Fibres being stretched long ways, cut the annular Fibres in right Angles; and it seems that these are those right Fibres of which mention is made by *Galen*, and still by other Anatomists: But what they call oblique I think to be only imaginary, because they are no where to be found in this Vessel. But it appears this error to have been familiar to several Physicians, to wit, that they have assigned to many *Viscera's* and membranous parts, right, transverse, and oblique Fibres, out of a false supposition that there was in every one of them, an attractive, retentive, and expulsive faculty, and that these three Offices should belong to the three orders of Fibres, all which indeed will appear to any diligent enquirer, to have been falsely assumed and upon trust. In the mean time I so far assent to *Galen*, that I acknowledge four distinct Coats of the Artery, yea those to be in this Vessel even as in the Ventricle, except yet that in the *Viscera's*, the retiform infolding of the Vessels together with the Glandulous Coat, is placed under the fibrated or muscular Coat, but in the Artery above it.

The use of the Coats.

So much for the conformation of an Artery in general, and its constitutive parts: As to what belongs to their Offices and reasons, it seems that the muscular Coat endued with fleshy orbicular Fibres, is of the chiefest use and operation. For this as we have already hinted, obeying the motion of the Heart, in driving about the Blood observes the perpetual turns of *Systoles* and *Diafoles*, for that whilst the fleshy Fibres of this are strained successively, and with wonderful celerity behind the River of Blood, there will be a necessity for its course to be most rapidly made from the Heart even to the extremities of the Arteries.

The fibrated for the Systoles and Diafoles.

The other Coats for the benefit of this.

To what end the retiform folding of the Vessels is.

As to the other Coats, and the Vessels distributed through them, they seem to be all instituted for the commodity and use of this one muscular Tunick: For in the first place the Nerves and their shoots every where sowed upon the Trunk of the *Aorta*, and its greater branches, and appearing outwardly do carry to the underlying fleshy and moving Fibres, after their manner abundance of Spirits for the performance of the continual task of *Systoles*, and besides they carry (as we have shewed before) the instincts of Sympathetick Contractions. Then the lesser Arteries (which we meet with next) strictly covering the interior superficies of the outmost Coat, lying next to the muscular Coat, are charged even as the other Arteries next the other muscles and solid parts with a double duty, to wit, that they convey and bring to the spirits continually to be renewed, the alible or nourishing

nourishing juice by which they are nourished and grow, and elastick Particles; then the Veins, the companions of the Arteries carry back whatsoever is not otherwise expended of the Blood.

But that these sanguiferous Vessels, planted without the musculary Coat, and complicated among themselves, do constitute as it were a retiform fold, from which only most little and very small shoots are sent forth, (as it is also about the Ventricle and Intestines) when as in many other muscles, these Vessels are interwoven with the fleshy Fibres, and make them therefore to blush or seem red: The reason of this difference seems to be, for that it is requisite for the sanguiferous Vessels to be separated a little and placed at a certain distance from the fibres of the *Aorta*, and the motional of the *Viscera's*, lest that the Blood perchance walking these more plentifully should be sometimes obstructed, and so bring forth a Phlegmon, or a soon killing Imposthume: Wherefore for the greater caution against such an accident, the glandulous Coat always coheres to the retiform folding of those Vessels; to wit, for that end that the serosities flowing over and above, both from the Nerves and from the Arteries, and not presently carried back by the Veins, might be presently received by those numerous Glandula's, and until they may be carried back to the Blood, (lest they should rush upon the moving Fibres, and should affect them with a Cramp) might be there contained.

The use of the glandulous Coat.

But that the net work folding of the Vessels, and the glandulous Coat sticking to it, is placed above the musculary Coat in the *Aorta*; and in the *Viscera* under it: The reason unless I am deceived, is this, *viz.* that these small Vessels which ought gently and moderately to dispense the Blood and Juices, might be removed as far as might be, from the estuation of the sanguineous Torrent within the *Aorta*. But in the Ventricle and Intestines, for the rightly performing of the Offices of Concoction, there is need of the former fire of the Blood.

In the Artery the folding of the Vessels is above the musculary Coat, but otherwise in the Viscera.

The reason of this.

The inward Coat of the *Aorta* investing its Cavity, seems to be chiefly constituted for these uses, that it might carry within it the Bloody Channel, and terminate the other parts of this Vessel: But besides we must yield to this something of sense, and perhaps something also of motion, for this being endued with nervous Fibres, is affected by the Blood passing through it, just as the Bosom of the Heart; and for that cause according to the sense of this, the musculary Coat is urged into frequenter or slower, equal or unequal motions of the *Systoles* and *Diastoles*. Moreover, this Coat has neer the Heart for the space of about two inches, greater, and as it were, fleshy right or longitudinal Fibres, in so much as I suspect in this place, by reason of the greater impulse of the Blood, the Artery not only to be strained and straitned as to its amplitude, behind the stream of the Blood, but like as in the heart, it to be contracted and shortned somewhat as to its longitude also at every *Systole*.

The use of the inward Coat.

I might here add many other things about the structure and use of this Vessel, not less profitable than pleasant to be known, so full and fruitful of contemplation is every the most little part or portion of the animated Body, that the more full knowledge of every of them singular being wrote down, might fill many Pages, yea the whole Book. If I should go any further in this digression, it would follow next to speak of the Veins, but it being omitted for this consideration (since that it makes little or nothing for the unfolding the reasons of Evacuation) we will pass over to the other kind of Medicines, to wit, to Hypnoticks.

Part 1.

S E C T. VII.

C H A P. I.

Of Opiate Medicines or Causing Sleep

*The vicissitude
of Sleeping and
waking necessary
for health.*

After the Cardiac Medicine by a certain Law of Method, the Hypnotick follows. For that Sleep oftentimes comes moderately and seasonably it becomes of it self a great Cardiac Remedy. But this passion is not always wont to be present, when nor as it ought to be, but sometimes affects us evilly with its troublesome presence, sometimes with its absence. By the true institution of Nature, Sleep and Waking, as *Castor* and *Pollux*, ought to have their turns one after another, and the one to give place to the other, according to the just bounds of Reigning. This vicissitude so long as it is rightly observed, doth very much conduce both to the preserving the health of the Body, and to the furnishing of the gifts of the Mind: But if the dominion of either of them be too long continued, it will quickly be that there will not be long a whole mind in a whole Body. By immoderate sleep, all the faculties both of the natural and animal Function, become very much stupified, and from hence one becomes more fit for the Grave than for Society. On the contrary, over great Waking destroys the strength, and makes infirm or perverts the Animal powers: Wherefore among the Remedies accommodated to our needs, the most wise Creator hath abundantly provided for these uses, to wit, that it should be in our power to procure or repel Sleep and Waking, as often as it shall seem convenient, and as often as they shall offend in excess, or in defect to moderate them: Which Medicines and by what means of working on the humane Body, they are wont to procure these desired effects, it now lyes upon us to shew, and first we will speak of Opiates or Remedies procuring Sleep.

*In the tract of
the Affections of
the Brain.*

That it may better appear what the Hypnotick Medicines do, and by what kind of affection of the Brain, animal Spirits, and of the other parts they cause Sleep, hither ought to be referred what we elsewhere have very largely discoursed, concerning the Nature, Subject, Causes, and effects of Sleep: To wit, we have shown the immediate subject of Sleep to be the animal Spirits, not all, but only of the Brain, and the inhabitants of the nervous *Appendix*, viz. which execute the Office of all the Senses, and of every spontaneous motion, they in the mean time being taken away, which serve for performing the actions of the merely natural and vital faculty.

*The Contents of
the Opiology are
four.*

These things being premised concerning Opiates, it shall first be enquired into, by what means they affect the animal Spirits, so that as it were by a blast of a Medicine, they presently as if they were bound fast in Chains, subside or sink down and leave their Tasks. In the second place it behoves us to shew where the Hypnotick Medicines begin their operation, viz. whether in the Ventricle or the Brain, or whether not in both together, or successively. In the third place, it shall be determined how far Opiates do extend their energies, whether they reach only to the Spirits of the Brain, and the inhabitants of its *Appendix*, seeing that they only are capable of natural Sleep, or else to the others of the Cerebel or little Brain also, and to those presiding in its Dominion. Lastly, in the fourth place, it will be worth our labour to add some notable Effects and Accidents of the chief Hypnoticks, together with the reasons of them.

1. As to the first of these, to wit, that it may appear by what means Opiates do affect the animal Spirits whilst they bring them to sleep, we have in another place largely declared our opinion: which is that I think they do not exercise their powers by raising up vapours into the head, nor by opening the Pores of the Brain, whereby the vaporous matter or otherwise soporiferous is admitted; but only by destroying or profligating some animal Spirits, wherefore the rest as being amazed, or compelled more inwardly, or at least being called back from their wonted Efflux into the nervous parts, do relinquish or remit for a little while their Tasks. It manifestly appears to be so, because Narcoticks, if they are taken in too great a Dose, for as much as they destroy the spirits in so great abundance that the vital Function can be no longer obeyed, cause death. But they being given in a just quantity, and with other circumstances aptly agreeing, for as much as they overthrow and amaze some spirits, and wholly extinguish others, they allay the too great fierceness and impetuosity of the sensitive Soul, for the end that she being made more contract, and as it were sinking down within her self may ly quiet: almost by the like means as when the insersion of water causes presently the compass of the flame more vehemently breaking forth to be restrained, and to be reduced within moderate bounds.

If that is further asked, in what matter and how disposed the narcotick Virtue of the Medicine consists? no manifest quality as of cold, heat, or of other kind ought to be pretended, nor presently must we fly to I know not what occult qualities. It may be lawful to suppose that Opiates do consist in such kind of Particles, which are greatly contrary to the animal Spirits, and are extinguishers or rather poysoners of them. It will not be easy to shew of what sort of substances or conformation the contrary Particles of either kinds are, because they are not perceivable by the sense, and the Analogy of the like adverse Particles is not met with in any other subjects. But yet as it is lawful to conjecture, it seems that as the animal Spirits are most subtil little bodies, composed of spirits and volatile salt united together and highly exalted; Opiates on the contrary consist of a stinking Sulphur, that is of Sulphur, with a fixed salt and earthy matter combined together, and carried forth to an efferation or fierceness; which kind of concrete, is well enough known to be so much contrary to the subtil texture of the animal Spirits, that sometimes they profligate them at a distance by their mere Effluvia, they being scarce or not at all perceivable by the smell; but their Particles (after they are taken inwardly) being diffused thorow the blood and nervous juice, wherever they meet within them some of the Bands of the Forces of the animal Spirits, they poyson them and as it were extinguish them. But in what places this is first or chiefly done shall be next inquired into.

2. We have formerly shewn speaking of sleep, this affection according to the ordinary rites of Nature to begin from the shell of the Brain, viz. the Spirits dwelling there and being as it were watchmen first of all to recede, and their Arms as it were being laid aside to give way to Idleness; then presently all the rest to whom these Idlenesses are permitted, in like manner lying down to indulge sleep.

These spirits of the first Band being about to obtain Rest, relinquish their Stations either because they are wearied or lessened in their forces, they of their own accord leave their Tasks until they may be recreated, or because they are drawn away from thence, or lastly drawn more inwardly by some gentle or pleasant handling. The first of these ordinarily and often happens by reason of an influx or inundation of the nervous juice, and sometimes of the serous Latex. For those humours being poured forth from the Blood (whilst that it is satisfied) washing the outmost Bounds of the Brain, into its cordial or shelly substance, fill the Pores and all the passages, and so they repress the spirits and hinder them from their free expansion by which they make their watches. The reason of all these and the means of doing it we have already largely declared in another Tract: From which being truly weighed it will be just to think that the Particles of every kind of Opiate after it is taken being carried into the Blood, and circulated with it doth chiefly exercise its narcotick or stupefying force neer the shell of the Brain; for they meet within this place the first forces of the animal spirits, and destroy or rather extinguish wholly many of these placed in the fore part of the Battle; then, by reason that the other spirits of this Troop being made now thinner go back, and their

Part I.

1. How Opiates do affect the animal Spirits.

In what kind of Particles their virtue consists.

2 In what places Opiates do first and chiefly operate.

To wit, first in the shell of the Brain.

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where they destroy the outmost spirits and compel the next to these to go back inwardly.

They lessen or call back their Efflux to the nervous parts.

Opiates by some means whilst they are in the Ventricle do exert their virtues.

The reason of this unfolded.

3. How far and to what parts the virtue of Opiates doth reach.

They do not empoison the Blood as they do the Spirits.

emanation being restrained fly towards the middle of the Brain; and so whilst these withdraw themselves from the Battel, and rejoyce for their retreat, all the rest within the sensories where they are placed as in so many watch-towers, their succours being gone, some follow and leaving their watches recede, and give way to idleness.

After this manner the Particles of Opiates for as much as they profligate, and destroy certain animal Spirits standing in the *Cortex* of the Brain, and do repel and put to flight those which are next, so that their influx to the Sensories is suspended, they procure sleep; but yet by what means, in so short a space (as it sometimes happens) viz. presently as soon as the Medicine is taken, and whilst it is scarce dissolved in the Ventricle, sleep creeps upon one, when it seems to be a work of some little time, in which the soporiferous Particles may be carried from the Stomach into the Blood and thence by its passage to the Brain, is not easy to unfold. First I may say to this that the Journey from the Ventricle to the Head by the Blood is expeditious enough, and may be performed in a very little time: but besides I am led to opine that Opiates sometimes by acting more immediately on the Ventricle and by its mere contact before there is any commerce of the Blood, do after a sort procure sleep. Elsewhere we have deservedly assigned among the evident causes of this Affection the aggravation of the Stomach; for how often does any one, having eaten more gross and undigested meats causing trouble and heaviness of the Stomach become presently sleepy? The reason of which seems to be for that there is a great affinity between the spirits of the Stomach and those inhabiting the Brain, and an intimate Sympathy betwixt them, so that the afflictions and evils of either of them do afflict the other (which indeed may very easily be shewn in many Instances) hence it easily comes to pass that by reason of the spirits which preside in the Ventricle being highly oppressed, and hindered from their free expansion, and as it were expelled, presently the *Hypostasis* of the whole Soul and especially that principal part set before the Brain in like manner is straitned contracts its Sayls and submits its whole self to the yoke of sleep. How much the rather may it be thought when at any time the spirits of the Stomach imbibing the opiatick Juice are impoisoned, and in a great abundance destroyed, that presently all those watching about the *ἐν κέφαλον* do every where give place, and are oppressed with sleep, which is not only the Image of Death, but sometimes one and the same? Indeed we have related elsewhere a very rare and true History of such kind of effects from *Opium* being taken, viz. of a certain strong man and moderately healthful, who having taken too great a Dose of *Laudanum* for the asswaging the colick pains was immediately taken with an intollerable weight and stupor about the Ventricle, and within four hours dyed, neither yet did there happen to him any sleep, but his last and deadly.

These are the chief and most usual places, viz. the Ventricle and the *Cortex* of the Brain in which Opiates exercising their powers do begin or procure sleep. Notwithstanding it appears besides by common observation that they being administered after many other ways, do impress a certain Narcosm or stupefaction to the whole sensitive Soul or at least to a portion of it which is ordinarily and naturally capable of sleep. A Liniment of *Opium* being applyed to the forehead, also an *Enema* imbued with its solution are soporiferous. Some have found to their damage the like effect from the same things being put into their Nostrils or a hollow tooth; so that it appears that this Medicine may be admitted from any place to the animal Spirits, and doth destroy whatsoever are next it by its mere touch; and sometimes so that a contraction or sinking down of the whole Soul as it were being moved with an Eclipse of the principle Faculties follows: although it is also very like that the Particles of the *Opium* may be carried from those places by the passages of the Blood to the *Cortex* of the Brain.

Having thus shown you the weapons of Opiates by which they effascinate or hurt, and the place where they first or chiefly operate, now follows to be spoken of the Sphere of their Activity, viz. into what parts or Particles of the Body, and how far in them they extend their forces. By what hath been already said it appears plain enough that they act upon the animal Spirits; but let us seek if not also upon the Blood, and other humours? certainly that the Blood is not at all vitiated by them, I judge first from their so very little Dose, by which it is highly improbable for the Blood to be empoisoned or corrupted: then for that though

Narcoticks

Narcoticks be often applyed, yet no *Stigma's* or Pustles or little wheelks appear in the skin or *Viscera*, which use to happen to the Blood being any ways empoysoned. Moreover to whom the use of *Opium* becomes familiar, that it does not hurt the animal Spirits although daily taken in a great quantity, no Dyscrasy of the Blood is wont to be produced from thence. In the mean time we must not think the Particles of *Opium* to be agreeable to the blood, and to be assimilated by it, but rather to be wholly heterogeneous and immiscible: wherefore it is no sooner come into its Mass but by and by they are expelled from it, and from thence being partly poured on the *Cortex* of the Brain, cause sleep, partly cast forth by the pores of the skin stir up Sweat, and not seldom an itching (as I have observed in many) very troublesome. As to the other Humours, I see no reason for us to judge that Opiates do affix any blemish to the *Serum*, or nervous Liquor, or lastly to the nutritious Juice; so that their virtue, and energy seems to belong to the animal Spirits.

Part I.

Notwithstanding they are wont to affect all these not after a like manner, but Opiates given in a moderate Dose do chiefly and almost only reach to those Spirits to whom the priviledges of natural and ordinary sleep is granted, the rest being either untouched or not much hindred. Wherefore from *Laudanum* being taken the senses both internal and external are tied up, in the mean time the Pulse, Respiration, also the offices of concoction and separation are performed after their wonted custom, and after some time the spirits of the former Dominion, their forces being restored do lastly shew themselves, and the chains of sleep being shaken off return of their own accord to their wonted watches.

Opiates primarily act upon the Spirits inhabiting the Brain.

If that an opiatick Medicine is more strong then it ought to be, it not only imposes more strong chains on the spirits of the Brain and those inhabiting its *Appendix* whereby they are longer bound up, but also enlarges its narcotick force into the other province of the animal Dominion; so that after its larger Dose the appetite is for the most part beaten down, respiration very much straitened, and is rendred not only difficult but also unequal; and also sometimes the motion of the heart it self fails so much, that the Pulse being weaker there happens a certain Eclipse or *torpor* of all the faculties with a cold Sweat, so that sometimes from such a Medicine follows a perpetual sleep, the reason of which is for that the opiatick Poyson being further diffused goes into the Globe of the Cerebel or little Brain and destroying or utterly discomfiting in great abundance the spirit inhabiting it, causes the motion of the Heart at first to grow weak and then quite to cease, so that the vital Flame is extinguished.

When their force reaches to the Cerebel or little Brain.

These things being premised concerning the nature, manner of working, subjects, and limits or Sphere of Activity of Opiates, it now lies upon us to recount the chief effects and accidents both good and evil which are wont to happen from the use of them: and then to add some cautions about the right method of Hypnotick Medicine, therefore let us see in the first place, after what manner and in what cases opiatick Medicines are wont to be helpful.

4. The good or evil effects of Opiates.

The good or benefit to be procured by the use of Opiates is wont to belong either to the animal spirits or to the blood and Humours: Those are indeed first and more immediatly, these only secondarily and by the means of those affected.

1. Their good respect either the Spirits or Blood and Humours.

As often as the animal Spirits being above measure stirred up act either too much or irregularly about the performing their offices for the allaying their force or inordinations, Narcoticks being timely administred do oftentimes bring notable help: those kind of exorbitancies for which the use of Opiates is prescribed, respect either the sense or motion. As the former Function is twofold, the chief services of the internal senses are watchings and *Delirium*; but the sickness of the external chiefly requiring this Medicine is pain. The irregularities of the Motions to be rectified by Narcoticks are first a more vehement Pulse, Convulsions of the *Præcordia* or *Viscera*, and also the too violent and excessive excretions of these. So there are many and divers cases in which whilst the animal Spirits like fierce and furious Horses run about, or leap beyond their bounds, they ought to be reduced or restrained by Opiates as it were with Bridles. We shall here briefly set down some instances of every one of these together with the means of doing and the reasons of curing.

They are required for the Spirits as to the sensitive or motive Function.

To either in a various respect.

1. In the first place therefore Opiates are necessarily and exceeding properly prescribed for watching or waking, for as much as sleep is an Affection contrary to this, and for that reason it becomes curative. For what causes and by what

In respect of the watching of the internal Senses.

Part I.

means watchings are wont to be excited and to remain a long time, we have largely enough shown in a late Tract; in all those Cases of the animal Spirits being sometimes too much carried forth, and being of themselves inquiet and importunate since they every where blow up and irradiate both the sensorie Organs, and especially the outmost Border of the Brain; the opiatick Particles, being carried hither by the passage of the Blood do forthwith destroy or cast down or scatter the Spirits watching in the forefront, so that the next who being compelled do abide more inwardly, and being kept from their emanation on every side, they are restrained very much, wherefore presently all the extrinick Spirits inhabiting the Organs of every Spontaneous, both sense and motion, being destitute of the wonted Afflux of those Capitals do also leave their watches and retiring inwardly do become Idle.

2. and Delirium.

Secondly in Delirian Affections Opiates are often administered with benefit (although sometimes they rather hurt, as shall be hereafter declared) the reason of the former is that when the Spirits being too much stirred up within the Brain, and struck as it were with a fury they easily leap beyond the customary and wonted Paths of their Passages, then a narcotick Medicine approaching nigh to the border of the Brain, doth repress them blown up like hounds that are apt to expatiate, and stops them a little while from all motion, as oftentimes when they are at last moved they repeat their former methods and rightly perform their ancient Functions.

In respect of the external sense for pain.

Thirdly *Opium* is esteemed of most excellent use for the quieting all manner of Pains whatsoever, wherefore it deservedly is wont to be called *Nepenthe*, and is a truly divine Remedy. And indeed we can scarcely enough admire how this Medicine, whilst some notable torture or intolerable Pain of some Member or the *Viscera* doth afflict, as it were an Inchantment doth yeild a sudden help and Cessation from Pain, yea sometimes without sleep or at least before sleep comes. Moreover 'tis yet more stupendious that whilst the Opiatick Particles do continue to operate and to exercise their narcotick or stupefactive Power, yea sometimes a little after sleep is ended there is an high Alleviation or easement and freedom from Pain in the Part afflicted, but then the force of the Medicine being spent, the Pains return, neither do they remit their atrocity, unless whilst they are charmed again by the same Medicine.

By what means Opiates do allay Pain without sleep or after it is ended.

It doth not easily appear to him who searches the reason of this, in what part the Anodyne Medicine doth most strongly operate and exert its Virtue, whilst it allays Pains without sleep or after it is finished, and continues its Cessation for some appointed time, viz. whether its narcotick Force is employed on the grieved Part, or on the common sensorie, or on the whole sensitive Soul. The reason of the Difference of the propositions is, because Pain being excited in one place is felt in another, and its effect is poured forth through the whole Soul. Its production consists in this, that the nervous Fibres are irritated very much, and pulled one from another by some incongruous, and greatly unproportionate thing, so that the Spirits abounding in them are by and by distracted, and being snatched from their equal expansion are agitated into Confusion: but the sense of Pain is effected for as much as that perturbation of the Spirits, by a certain undulation through the nervous Passages to the common sensory, viz. chamfered, delated Bodies, doth stir up the Spirits there implanted into the like Distraction: which sort of Affection going forward even to the very middle of the Brain, moves the Imagination, and from thence being presently reflected thorow the whole *Hypostasis* of Spirits, diffuses a certain trouble or inquietude. Therefore as this Pain is a Passion so largely extended and of so various a respect, it may well be searched into, what kind of Sphere of Activity Anodynes have.

Concerning these there is no cause of Doubt, but as often as sleep is induced by *Opium* being first taken, a Cessation from Pain consequently succeeds: then also this more immediate effect of it presently follows; to wit, for as much as those which actuate the first sensory are also bound with the Spirits inhabiting the Brain; and for that cause although the paining Part be irritated, the sense of all Pain is inhibited: but indeed that when the patient awakes, and so remaining doth lively exercise all the animal Functions, continues free from Pain for many hours after the *Opium* is taken, and then the strength of the Medicine being spent presently the same Tragedy returns, this Knot certainly deserves to be loosed.

For

For the solving of which we may not say, the Spirits of the grieved part, or those inhabiting the common sensory, viz. either these or those singly or both together are bound by the Anodyne Medicine. For that it is not credible for the particles of the *Opium* so to penetrate and so deeply to enter into the Brain and nervous Stock, that in so short a time they should descend, that being overcome and unhurt to its outmost Confines; further neither is it to be thought, that the Spirits inhabiting the chamferated Bodies (whilst the *Analefia* or Cessation of Pain for some time during the waking remains) being awakened for the receiving of all the Impressions of other sensibles, are made deaf only to the approaches made from the paining part. Since therefore the Indolency after sleep is finished, ought to be referred neither to the grieving part, neither to the first sensory stupefied by the *Opium*, let us see how the reason of this may be deduced from a certain narcotick Affection of the whole sensitive Soul. After we have premised these two things this will easily be manifested.

In the first place it is absolutely necessary for the stirring up or continuing of any pain, that there be a very great plenty of Spirits abounding in the part affected: because the exandescency, distraction, and mutual allision or beating of the tumultuating Spirits one against another, are the conjunct Causes themselves of that troublesome sense which is called Pain; wherefore if that an afflux of Spirits from the bound Nerves to the paining place may be hindered or much diminished, there will be a necessity for the Pain to cease; for that those Spirits being destitute of new forces or supplies, ly so thinly and dispersed in the Fibres, that they scarcely touch one another, at least that they do not break forth into furie and indignation.

2. This kind of Destitution or withdrawing of Spirits here required for the causing an *Analefia* or Cessation from Pain, and may be procured by no other remedy or experiment is very often produced by *Opium* being given. For truly not only some outmost, and as it were precursory Spirits (as is said) are destroyed by the Particles of this Medicine besieging the Border of the *ἐνκέφαλον*, but the first springing forth of these within the midst of the Brain and Cerebel, and for that cause the Efflux upon the nervous Stock by and by are greatly suppressed, so that during the Energie of the *Opium* they are dispensed much more sparingly and less into the *Præcordia*, *Viscera*, yea and into all the other parts. Hence the Pulse and respiration do remit of their vehemency and quickness, and sometime this becomes suddenly difficult or hard and that weak or debilitated; also for the most part there comes upon all the Members and Limbs an unwonted Languor and Sloathfulness. Moreover from hence the *Viscera* being before provoked into either excretory Convulsions by Vomit or Stool, or dolorick as in the Collick or Stone, do leave their inordinations: viz. for this reason because whilst that a subsidarie plenty and Supplements of Spirits are wanting in the part afflicted, those few that are left are not at leisure any longer for tumult and anger: yea that they may be able to subsist and maintain themselves they ly quiet: But afterwards when the Particles of the *Opium* being scattered or blown away, the stock of Spirits within the *Encephalon* and their emanation from thence on the nervous Parts is renewed, so that they may descend again to the Parts affected in a full Stream and fill full again their Fibres, forthwith by reason of the Spirits being again accumulated and stirred up as before, the same Convulsions or Pains return.

Without doubt according to this means of affecting and according to the reason but now assigned Opiates do for the most part quiet the fiercest Pains, and do procure an Indolency with or without sleep, and do continue it for some determinate time after sleep is a good while finished; which space being elapsed, the Pains by and by do wax grievous again and are shortly increased to their wonted fierceness. The Effect of these kind of Affections, is commonly enough known in the Cure of the scorbutick Collick, and seems as it were a certain Exorcism; for as much as the Pain, as a *Dæmon* or evil Spirit may be only bound for a certain determinate Time, and then again begins to rage. Among the dolorick Diseases to which *Opium* brings help, the Gout and Stone in the Bladder may by right challenge a place. In Arthritick Pains that Anodyne has been an egregious and as it were a divine Succor. This latter Disease, when it rages most cruelly in old Men and that they cannot be cured by cutting, it admits of ease by no other Remedy but

Part I.

The reason of it unfolded.

It consists in those two things, viz. in the first place there is required to Pain a copious Afflux of Spirits to the part afflicted.

which Opiates spend.

For the same reason Opiates take away Convulsions.

They help in the Stone and Gout.

from

Part I.

from Narcoticks. Wherefore in this case I have perswaded some to the constant and daily use of *Laudamm* or *Diacodium*, which as they have done with great comfort of Life, they got no hurt by it; although they encreasing its Dose ascended to a great quantity. So much for the Reasons of healing or helping the to be regulated enormities of the sensitive Function which *Opium* is wont to help: let us at length see how, and how much this *Panacea* serves for the healing or quieting the irregularities of Motions,

2. How Opiates help the irregularities of the motive Function.

2 The Immoderation or Irregularity of the motive Function for the rightly composing of which the use of Opiates is prescribed, have chiefly a respect to the *Præcordia* and *Viscera*; (for Convulsions about the Head and Members do not so necessarily require this Medicine.) To the first of them ought to be referred the Pulse, and Respiration, as often as this or that shall be more frequent or more vehement than it ought: For when in Fevers the motions of the Heart and Lungs being more intense do more rapidly carry about the Blood so that then both as to its accension, and as to its *Crafsis* it is greatly perverted, and cannot separate its superfluities being so thorowly incocted, the impetuosity of those parts is somewhat broken by a Narcotick being administred; so that the Blood by and by being gently and temperatly Circulated it diffuses a less intense Heat, and being loosned in its Joynting, sends forth its *Serum*, and impurities by Sweat and Urine. Opiates do extenuate and depress the Act of the Pulse, and of Respiration; for as much as they do somewhat stop the Springs of the animal Spirits in the little Brain, and diminish their efflux from thence destinated to the nervous *Præcordia*, which if it should happen to be too much, then a great defection of the Vital Function, yea sometimes Death follows.

1. They lessen the vehemency of the Pulse and Respiration.

They regulate the inordinations of Respiration.

Respiration not only as it is vehement but also for as much as the same may be interrupted, Convulsive or divers other ways irregular, frequently hath need of a Narcotick Medicine; this is wont to help before all other Remedies in a violent or very frequent and continually troublesom Cough. But in Asthmatick Paroxysms where the Organs of Respiration being most laboriously exercised, the diseased seem to be in the very Agony of Death it self, a Dose of a very fit Opiate, as it were unexpectedly renders all things presently serene and tranquill. The reason of which sort of Affections is, that in those Dispositions where some trouble doth beset the chiefly vital Parts, the Spirits inhabiting them being highly irritated break forth into cruel Excandescencies and by acting too much disturb and invert all things: wherefore when a Narcotick being taken, the Succors are drawn away from the Spirits so raving, they presently being extenuated and as it were succourless, lay down their inordinations. Further a Narcotick Medicine seems no less necessary against the immoderate or Convulsive motions of the *Viscera*, viz. of the Ventricle and Intestines. For this is wont oftentimes to help chiefly in horrid Vomiting and in too excessive or violent purging. The Dysenterick Affections can scarce be cured without *Opium*; not that this Medicine fixes the boyling, and fierce Juices and Humours, but stops the excretory Convulsions of the Fibres, and that partly by stupefying by its meer Contact the spirits implanted within the Cavities of the *Viscera* themselves, and partly by suppressing the Spirits within the Cerebel about to flow from thence to those parts, of whose aid being deprived they easily lay aside their Convulsive Excandescencies. I might here recount the Convulsions or pains of other parts that are wont to be either allayed or taken away by *Opium*, but there is now enough said of the Energy of this Medicine, and of the Effects of Anodynes which are shewn first and chiefly on the animal Spirits; let us now see what kind of Virtue and alterative force it obtains on the Blood and Humours.

Further Opiates do allay the excretory Convulsions of the Viscera.

How Opiates operate on the Blood.

And indeed there is no body almost of an ordinary Capacity but sees plain enough that Opiates operate on the Blood and Juices of our Body and do allay their Inordinations. In Catarrhs and Defluxions of every kind, we fly oftentimes to these as to the last Refuge; these strongly stay bloody excretions, also restrain the Serous when they are excessive and colliquative or melting, or reduce them: They repress the immoderate Ebullition of the Blood growing feverishly hot, and lessen the too great inkindling thereof. Lastly these happily quiet all fluxes from whatsoever cause stirred up in our Body, and induce most often an Halcyon or calm state to the Blood however disturbed.

Although

Although these sort of Effects for the most part are produced (as we intimated before) thorow the mediating Affections of the animal Spirits (for that the nervous Fibres being inordinately contracted do agitate the Blood and Humours, and compel them into divers fluctuations and exundations, therefore a suppression of these Convulsions by Opiates presently renders these smooth and tranquil:) But yet it seems also probable that the opiatick Particles, whilst they are poured into the Blood do cause certain alterations to its Liquor by their meer syn-crasie or Commixtion: for we have shewed above that these are altogether untameable, and immiscible and heterogeneous to the Blood; which therefore since they appear not Enemies or injurious to its Liquor, may be after a sort esteemed for Alexiterians, of the same sort doubtless, which being confused with the Blood, do quickly and almost untouched pass thorow its Mass, and by opening all holes and Pores in their Passage make an open way for the Serum and other superfluities or malignities closely bound or shut up, to go forth, yea drive them before them out adooers. Wherefore not altogether undeservedly is it that *Opium* is (as it were an *Alexipharmacum*) put into the Compositions of the chief Antidotes as of Treacle, Mithridate and *Diascordium*.

Indeed, tis a sign that the Particles of *Opium* being eaten are presently carried into the Blood and swiftly pass thorow its Mass, because they suddenly, after the Medicine is taken, being carryed to the *Encephalon*, procure sleep and ease. Moreover it appears by common Experience that they procure Sweat and move Urine, in so much that these effects are reckoned commonly to the Virtues of *Opium*. Further that its Particles are not Venomous to the Blood but rather Alexiterian or resisting Poyson may be gathered from hence, because that *Laudanum* is oftentimes administred with great success in the Plague, small Pox, malignant Fevers, yea also in divers others: but in the mean time we do not easily apprehend those Qualities which some attribute to this Medicine of fixing and thickening the Blood; unless perchance it may be said to effect it, for as much as by unlocking its joynting, it causes its serosities to be plentifully separated and sent away, so that the remaining Liquor becomes thicker and more Compact.

But indeed that Opiatick Medicines do fuse the Blood and sometimes after the manner of *Alexiterians* move both Sweat and Urine strongly as I have found it by frequent experience, so by the following History (which I here add for a conclusion) it shall be manifested to all. Some time past I was advised with concerning a certain Gentleman very caco-chymick or full of evil Humors, and miserably vexed with nightly Pains arising from the Venereal Disease being not, or not well cured. I prescribed many things, but in vain; because very much abhorring Medicines he would yield to take nothing almost besides a Dose of *Laudanum* only once or twice a week for the appeasing his Pains; shortly become Hydropical from an *Ascites* and also an *Anasarca*, he swelled so much that he could scarce move from one side to the other without the help of Servants. In this condition I being at length sent for to him, and finding him obstinate for his foretaken Medicines, I made a Prognostick that he was not far from Death and that it was certainly to be expected, therefore he should prepare himself and his affairs for Eternity. He not much disturbed earnestly asked that for his more easy dying, he might take our *Laudanum*, before but sparingly permitted him, at his pleasure or at least in the Evening also: granting it with a certain admonition, I left him and gave him as I thought the last farewell. Afterwards he took that Medicine dayly, and dayly increased its Dose so that in a short time he had taken an incredible quantity of it. By the use of this only Medicine he grew better every Day, and within a months space was so well that being free from all Humours and Pains, he had got a Stomach and went abroad. By the assiduous use of this Opiate his Thirst before much troubling him went away, and being every Night put into a great Sweat he also made plenty of Urine. I might here shew many cures of of other Diseases esteemed deplorable performed only by the benefit of *Opium*; but this being somewhat besides the matter and tedious, I will only note in short one or two more.

Almost three Years since a noble Woman after an autumnal Favour fell into a cruel Colick with Vomiting and sharp pains miserably afflicting the Members and *Viscera*. Remedies of every Kind both internal and external being careful-

Part I.

By what means
Opiatick parti-
cles operate on
the Blood.

They quickly
pass thorow the
Blood.

And therefore are
to be esteemed A-
lexiterian.

They move Sweat
and urine.

A notable His-
tory of their such
like Efficacy.

The second His-
tory.

ly

Part I.

ly administred for many Weeks, became useles, but the noble Lady within twenty Days was reduced to that Languor and extenuation of Body, that therè was scarce any hope left that she should ever recover again: for being fixed to her Bed and almost always without sleep, she was constantly affected with the trouble or egrotation of the Ventricle, casting back again by Vomit whatever she took either of Physick or Food, besides she was almost continually tormented with Pains about the Belly and Loyns, and sometimes also in the Head and Joynts: being sent for to her, when I had tryed divers Medicines, nothing agreed with her besides a Dose of liquid *Laudanum*, which at first I ventured to give and that not without fear and caution twice only in a Week for the mitigating her Pains: she desired at length that she might take that remedy every other Night, and then every Night. And so using this without any hurt, she obtained at Night a plentiful sleep and pleasing enough, and for some time an Idolency and easie digestion of her Stomach, and so by degrees gathering strength left her Bed and began to fall to her wonted Aliments; but then she could and would take other Medicines, till at length she was quite well.

The third History.

No less was a certain Woman of note wont to declare the praises of this Divine Medicine being obnoxious for very many Years to most cruel Colical Pains. For as often as she fell sick of that Disease, she felt intolerable Torments and could be releived by no Remedy besides *Opium*, wherefore she took every Night a Dose of it, until the morbifick matter being by degrees taken away, she at last became free from all Languishment and Pains.

CHAP. II.

Of the Harms and Incommodities of Opium, to which is added Cautions about the use of it.

Hitherto we have shewn the good of *Opium* and as it were its Angelical Face, together with the manner and the Reasons of its helping. If the other *Phasis* of this Medicine as of a turned piece of Coyn be looked upon, it will appear plainly Diabolical; in which we may find out not less of hurt and Evil than we did of benefit in that of the former; so very much Poyson is joynd to this Medicine, that by its frequent and familiar use we cannot secure our selves; wherefore as we have declared its benefits, so it behoves us to admonish you of its harms, so that it is with this Medicine as with a Sea Voyage; that the less danger and difficulty may be met with, 'tis fit that both the Ports they may run into, and the Rocks to be shunned, be well known.

which and how many ways *Opium* is wont to hurt.

That the use of *Opium* hath been sometimes thought hurtful and evil, we have seen by the sad experience of some who have no sooner taken it but they fell into a perpetual sleep, and of others who by reason of too great or untimely a Dose of it have snatched away their Lives or else render it unhappy and unprofitable afterwards, by the hurt of the principal Faculties. Instances and Examples of this Nature are every where too frequently to be met with, made by Quackfalers and Empiricks. I have known some who having taken a Pill of *Laudanum* to have fallen into so profound a sleep that they could never be awakned: they have lived indeed three or four Days having their Pulse, respiration and heat well enough, yet not to be recalled to Sense and waking by any remedies or tortures. However I have observed from *Opium* taken by others that they have slept moderately only, yea sometimes little or not at all, and presently to be worse as to their pulse, respiration and heat: these indeed were wont to languish as soon as they had taken the Medicine, then to draw their Breath difficultly, and so grow worse and worse, nor could their strength be restored to them by any Cordials but by degrees

degrees lingering they lost their lives. I have somewhere received an History of a certain robust man killed by *Opium*, who fell into no Sleep but the last and deadly, viz. Death it self; he presently upon taking the Medicine, complained of a great weight and coldness of his Ventricle, by and by he was affected with a notable *languor* and a sinking down of all his Spirits, and a coldness of the extreme parts; and within four hours complaining that his eyes grew dim and then quite blind, he expired.

Part 1.

By this 'tis easily gathered that *Opium* does not always destroy Life by one and the same way, but has obtained at least two chief ways of killing. The Reason of one of them consists in this, that the Particles of the Medicine being taken, do first and rather affect the Brain; of the other, that they in like manner infest the Cerebel or little Brain. As to this latter the business is according to the following manner; if after the Medicine being taken, it happens by chance that the Orb of the Cerebel be so beset by the narcotick little Bodies, that the outmost spirits being forthwith destroyed, the afflux of the interior towards the *Præcordia* is diminished, and then by little and little cut off; there will be a necessity for the heart and the Organs of Respiration. first of all to flagg in the duties of the vital Function; and then wholly to cease from labour: In the mean time as the sick being free from an heavy *torpor* do awake, they are well enough in mind, and whilst they live are perfect in Sense. But if the opiatick Particles breaking in first of all, and with a full charge upon the border or Sphere of the Brain, and its inhabitants are strongly invaded; in so much that by and by the outmost Spirits being profligated, also all the internal possessing its middle are greatly overthrown, and left they may spring up again and recruit anew, their forces are altogether suppressed, then presently a deep sleep or an invincible and perpetual drowsiness or stupefaction follows. In the mean time the Pulse and Respiration continuing for some time in a due state.

Its Poyson affects
first either the
Brain or Cerebel.

Besides these kind of deadly slaughters which *Opium* still attempts upon humane Life, this Medicine hath obtained very many other ways of hurting, which oftentimes becomes destructive to some private function or part of the Body. Since 'twill be tedious to rehearse all the kinds of lesser harms, which Narcoticks are wont to stir up, we will here only shew what evils do sometimes happen from the improper or untimely use of it in the Head, what in the Breast, and also what in the Belly.

It produces Evils
in the Head,
Breast, or Belly.

1. As to the First, it is well enough known that the chief Functions of the Soul, viz. Memory, Discourse, and sharpness of Wit, are very often notably hurt by Narcoticks. The frequent use of them debilitates the memory in many men, I know one that lost that faculty wholly by too great a dose of *Laudanum* taken when in a Fever; then after some weeks; when the use of it begun to return, he could only remember what was done at a certain or peculiar time, and nothing of what was done before or after. I know some to have contracted a slowness or stupidity of wit, and others madness by this Medicine. Hence (as *Freitagius nortes*) when *Prosper Alpinus* and *Bellonius* write, that the Egyptians and Turks are fed with *Opium*, for getting Boldness, Alacrity, and Appetite to Venus, they add however, that those devourers of *Opium* although they seem to be well in health and not to be hurt with the use of it, yet that they are rendered more cold, and that their functions were worse, and that they appeared almost perpetually drunk and torpid, and were made full of Hair stupid and inconstant, now affirming and now denying, so that people were afraid to meddle or converse with them; that also it became a by-word, which they objected as a blot one to another: Go thou hast eat *Opium*, which is no other than amongst us, when they upbraid any one of Fuddling or Drunkenness. *Freitag. lib. de Opio Cap. 3.* The Reason of these appears plain enough from what hath been already said, viz. *Opium* produces the effects but now recited, for that it assaults first and chiefly the Brain, and whilst it there destroys or profligates some animal Spirits, it perverts many others from their wonted ways of Emanations, and bends them into devious or unusuall tracts. But that *Opium* is devoured in a great quantity by the Turks (I may add also some of our Countrymen having gotten by long Custom, as it were, a certain defence or Armour of proof against its poyson) unhurt, or at least without any danger of life; the Reason is because its Particles, although at first they are infestous and poysonous to the Spirits, yet by the frequent use they at length become more congruous and familiar; even as

In the Head.

How *Opium* affects
the Turks.

Part I.

we have observed concerning the taking of Tobacco in a Pipe, which when 'tis wont at first for a few days, to cause a *Vertigo* or dizziness, and oftentimes vomiting or purging, yea a cold Sweat with a trembling, and frequent faintings; yet afterwards we take it without any disturbance, yea at length with great delight. But that a greater dose of *Opium* should add to them a boldness of Mind, so that they go to fight undauntedly and with notable confidence, the cause seems to be that that Medicine by stupefying somewhat the Spirits renders them astonished, so that how terrible soever the things be that they meet with, to the Senses they are unmoved. Lastly, that it is asserted that Opiates provoke to Venery, when it should rather seem they should suppress that fury by their extinguishing the Spirits: We say (if that in truth it has that effect) that the genital humour and the Spirits abounding in it, do not descend from the Brain, but is poured forth immediately into the spermatick Vessels, because that for as much as Opiates do hinder or make less the *genesis* of Spirits within the Brain, perhaps they cause them to be more plentifully diverted to the genital members.

2. What evils
of the breast O.
pium produces.

2. That Opiates are sometimes hurtful to the *Præcordia* and Breast, it plainly enough appears, because they depress and diminish the Pulse and Respiration; and sometimes also (as we have shewed above) cause them to grow weak, and by degrees wholly to cease: Wherefore in Fevers where the Blood being greatly depraved, seems to have no, or no good *Crafsis*, and that it yields to the Animal Kingdom but very few, and weak Spirits only, Narcoticks are almost always hurtful, and as it were poisons, for though in the Plague and in malignant Fevers, whilst the Pulse and Respiration are strong; Mithridate, Treacle, and *Disascordium*, yea *Laudanum* are oftentimes given with success: Yet if at any time in those Diseases, and in other Fevers not much malignant, the vital function languishes, these famous Antidotes are but very sparingly, but more strong Opiates not at all to be used. Moreover, in a most laborious Cough, Phthisick, Pleurisie, *Empyema*, and in other Diseases of the Breast, in every one of them where Nature is stirred up, suddenly so that casting forth what is troublesome and grievous to the Breast, and urges it with its great endeavour, and also where the Organs of Respiration being destitute of great plenty of Spirits, grow weak, and perform their work difficultly and hardly, we must abstain from *Opium* no less than from Poyson; for in such a case Narcoticks increase the weight to be removed, and fix it, and lessen the strength of the parts which ought to remove them away.

3. And what in
the lowest Belly.

3. We have above shewed that Opiates do operate within the *Viscera* of concoction and other parts of the lower Belly, and oftentimes in a various respect do bring notable helps, notwithstanding they are not always so benign and friendly to this Region; but as it will be easily shewed they sometimes cause a great evil. For truly Narcoticks being often taken, are very injurious sometimes to the principal faculty, *viz.* to the Appetite or desire of Aliments, (on which depends all nourishment, and the Root of Life) for that they very much blunt it, and not rarely wholly destroy it: For when the Spirits inhabiting the interior Coat of the Ventricle, are stupefied or destroy by the Opiatick Particles, so that those nervous Fibres although empty are no more corrugated, for which cause all hunger ceases, and food not at all desired, but that being brought to the Stomach, because being what is given is rather a trouble than delight; it is by and by spewed forth again. Moreover, for the same Reason the concocting force of the Ventricle is often debilitated; and the excretory motions both of this and of the Intestines, grow sluggish: For 'tis a common observation, that the want of Appetite, and slothfulness of the Belly, are the familiar effects of an Opiatick Medicine.

Physical Cauti-
ons about the use
of Opium.

1. In respect of
the constitution
of the Sick.

From these it will not be difficult to draw precepts and medicinal Cautions, about the right use of opiatick Pharmacy, which indeed may be done by observing these four following things, *viz.* Before a narcotick Medicine be administered, we must weigh, 1. What the Constitution of the Patient may be. 2. What kind of Disease it is with which he labours. 3. In what state the Animal Spirits are, in respect both of the Animal and Vital Function. 4. And lastly, in what condition the Blood and Humours are.

1. As to the First, when an Hypnotick is required, see that the Temperament of

of the Sick, the habit of Body or Indisposition, Custom, kind of Life, do not indicate the contrary. As for example, those who are endued with a moderate stature, firm Body and well set, hot Blood, lively or quick Aspect, do better bear this Medicine, and more often take it with benefit; which besides they may much more securely use, if they have been before accustomed to it. On the contrary, it agrees much less, yea is sometimes very hurtful to those who are too fat or too lean, likewise to those who being of a rare texture have Spirits easily dissipable, or of a more cold temperament, have soft and flaccid Flesh, and that are of themselves sleepy and dull, of a sluggish and indocile nature: To which add also if that they never had experimented that Medicine before.

Part. I.

2. The nature of the Disease is of great moment sometimes for or contrary to Opiates. In more light affections to make use of it (according to *Septalius*) is the trick of a Physical Adulator: In the Palsie, *Vertigo*, *Incubus*, or Night-mare, Apoplexy, also in the *Orthopnea* or straitness of the Lights, in the Dropie of the Breast or *Abdomen*, in the *Stupor* or trembling of the Members, in very malignant Fevers, and in the paroxysms of intermitting Fevers, or in the *Crisis* of others, Narcoticks are most often interdicted. Besides in the Cough with much spittle and thick in the *Asthma*, and in all other thoracious Affections with an oppression of the Lungs, and in the Hysterick and other convulsive Passions, they are not to be given but rarely, and not without caution and counsel of a prudent Physician. But yet in cruel Headach, Catarrhs, Colicks, Plurisie, ordinary Fevers, in Vomiting, Dysentery, in Nephritick Paroxysms, in Gouts and all kinds of Pains, the opiatick Pharmacy is not only allowed, but is sought for as the only, and as it were divine *Panacea*.

2. In respect of the Disease.

3. But as often as this is proposed or is deliberated on, we ought also to consider in what condition the Animal Spirits presiding in each Dominion are: For if they are already few or oppressed, and do not enough expand themselves; they ought by no means to be any more lessened or thrown down by Medicine: Wherefore whilst that the Animal Faculties as to the sense or discursion are not very vigorous, or do not sufficiently exert themselves, or when the Pulse and Respiration take the turns of their reciprocations but weakly, or are stopped or unequal or also more quick or slow than usual, or lastly, if a *stupor* or enervation with an unwonted languishment, possesses the members and motive parts, all kind of Hypnotick Pharmacy is to be avoided: But we doubt not to use the same, when at any time it is required by reason of some more grievous Diseases, if that the Animal Spirits according to these and the other respects be robust enough, or are also too much expanded or enlarged, or carried forth above measure or become fierce or unruly.

3. In respect of the animal Spirits.

4. But in the mean time the Condition of the Blood and humours is not to be neglected, because sometimes the wicked and naughty condition of these does altogether forbid Opiates, or permit them to be taken but sparingly, and with a certain restriction: The Blood forbids the use of them when it offends either in quantity or quality, or in its *Crisis* or Disposition. As to the former, the bloody *Latex* either superabounds or is deficient; in either respect it excludes Narcotick Pharmacy: For in the first place, whensoever the Blood is turgid with plenty, and boiling up as in a Fever, it hugely distends the Vessels, and so the *Præcordia* do highly labour to drive it about most quickly, with swiftly repeated turns of *Systoles*, lest it should any where stagnate or flow over; then certainly to give a Narcotick, whereby that labour and endeavour of the Heart most necessary for the preservation of Life should be hindred; would be the part rather of a poysoner than of a Physician. Wherefore in the *Plethora* or overcharge of Blood, Phlebotomy ought to be used instead of Opiates. In the second place, no less evil proceeds from Narcoticks, as often as in the defect or want of Blood; as after great hemorrhages, long fastings, or continual sicknesses they are administered, because, when the flood of the Blood is very small, and by reason of its exiguity hardly continued, lest that its *fluor* should be broken off and so cease; the Heart strives for or endeavours its quick circumagitation, working with a very nimble Pulse, as it were, with double endeavours. From hence it is plain to conceive what hurt Opiates will cause, which put a *remora* or stop to this endeavour of the Heart then so highly necessary. Indeed for this Reason it seems to be that we interdict Sleep to women presently after the Birth of the Child, whilst the *Lochia* are flow-

4. In respect of the Blood and Humours.

Part I.

ing down, and to others in a free mission of Blood or immense Hemorrhage, viz. left the Spirits in the time of Sleep being called back, should leave the Heart with which it swiftly drives about the diminished River of the Blood. Further, sometimes the Blood offending in quality, or (as I may more properly speak) in its *Crafsis*, forbids the use of Opiates; because whilst in a *Cacoehymia* or Fever, the Blood being very much stuffed with recrements or superfluities, ought to be agitated and more swiftly circulated by a greater labour of the Heart, to wit, that the heterogeneous Particles might be overcome and quickly evaporated; the operation of a Narcotick coming between doth stop this endeavour of the *Præcordia*, and so retards, and sometimes frustrates the lustration or circulation of the Blood.

As to what respects the other recrementitious humours, that are wont to be accumulated within the Ventricle or Intestines, these also ought to be carried away, or purged forth by Vomit or Stool before an Opiate be administred; for otherwise being fixed there they will stick more pertinaciously. Because the Splanchnick Fibres being stupefied by the Medicine are not irritated as before; neither easily go about or lively perform the excretory Convulsions for the expelling those superfluities: Wherefore according to the old Precept, if that there be any thing to be evacuated, let it be evacuated before the Narcotick Pharmacy or Evacuation.

C H A P. III.

The Kinds, Preparations, and Forms of Opiates.

After having sufficiently unfolded the Narcotick Pharmacy in general, and shewn the means and the manner of its working, it behoves us next to recount and particularly consider, both the simple and compound Medicines endowed with such a virtue, and so to institute a certain Opiology.

The distinction of Anodyne Medicines.

Therefore in the first place according to the Method observed by most Authors, we will distinguish Remedies accounted for Anodynes into two forms, viz. as they are stronger or weaker: For indeed some of them being plainly narcotick do not only compel to a preternatural sleep, but as occasion requires indolency, Stupor, and unduly given, not rarely Death. But yet there are other Medicines of this kind prescribed, which not by stupefying or destroying the angry Spirits, but by stroking and softening them, gently draw and compose them to Rest.

A rehearsal of Narcoticks.

1. They are wont to refer to the former Class of these (which may only be properly called Opiates or Narcoticks) Poppy both the white and the wild, Henbane, Hounds or Dogs tongue, Mandrakes, Nightshade, and certain others more venomous; and so never to be medicinally prescribed: But the Roots, Leaves, Flowers, Seeds, and the thickned Juices of some of these not so unwholesome are made use of, and (as we have above shewn) are often taken with great success. But truly since each of these have something of poyson mixed with them, therefore they are not indifferently to be prescribed, now these now those, as in other Physical Medicines, but only to make use of those which are approved of by a safe and long experience. Hence at length Custom (from which it is not safe to recede without danger to humane Life) hath obtained that Poppy and preparations of it, are the Basis or Complement of almost the whole opiatick *Pharmaceutrice*, the seeds of Henbain, and the Roots and Juice of Hounds Tongue, are put into the compositions of some Hypnoticks; notwithstanding as often as we endeavour

White Poppy.

deavour thorowly and also safely to provoke Sleep, the whole force of the Medicine is placed in *Opium* or *Diacodium*. There will be no need here to describe the white Poppy, out of which these are made, nor to shew the extraction of the opiatick Juice, or the composition of that Syrup, since that they are sufficiently enough declared in the Botanick and Antidotary Books both of the Ancients and Moderns. But what remains for us to do and which is more to our purpose, is that we now endeavour to expound the elementary parts of *Opium*, and from thence to search out the vertues both of the *Diacodium*, and the means of their intoxicating.

Part I.

The body of *Opium* may as to its constitutive parts be better known, and examined whole and untouched, than resolved spagyrically: because if it be distilled by fire by reason of plenty of impure Sulphur it contracts an horrible *Emperuma* or fiery taste, and diffuses a very hurtful stink. But yet it is obvious to the sense that sulphureous Particles do abound in this concrete, which also its most filthy *Odor*, and its inflammability manifestly declare: and although it is equally certain that saline Particles are adjoynd to the Sulphur, and so this concrete doth chiefly consist of these two together with a little Earth, yet of what nature and in what state that Salt should be, cannot be defined; but so much we may be able to affirm from the effects that this sulphureous saline Concretion is altogether contrary, and destructive to the Texture of the animal Spirits, which is spiritual and saline volatile. And indeed it may be gathered from very many instances that narcotick force lies hid in the Sulphur with the aculeated Salt (from whence it acquires so stinking a smell) for of this nature are the white Poppy, Mandrake, Henbane, Tobacco, and other Opiates, all which have almost alike stinking smell, and in the smelling to them very ungrateful to our Spirits. Moreover because the animal Spirits may be somewhat of a divers Texture in various Bodies, therefore Opiates may work more strongly and virulently on some than others. The Turks and Egyptians, in whom from an adust blood, more fixed Spirits and less volatile are procured, eat *Opium* without hurt or at least without danger of Life, the Europeans not so, who have more subtle and purer Spirits. Dogs devour *Opium* in a great quantity without any sleepiness or death. A little dose of it presently kills a Cat, for that the spirits of this beast, so very saline volatile cannot at all endure the narcotick Sulphur. And hence it is that one grain of the oyl of Tobacco being laid upon the tongue of this Animal presently excites Convulsions and Stupor, to which forthwith death follows. Once I saw given to an ordinary Dog sops of Bread rolled in ʒij of *Opium*: after which growing very sick he became torpid or rather stupid, and drawing his Breath difficultly and laboriously seemed as if he was about to dye, but then within half an hour he eased his belly plentifully with the most horrid and troublesome stink that ever I smelt in my life, and presently thereupon he became well and lively. But that such a quantity of *Opium* did the less hurt to this Animal, perhaps the cause may in part be the notably acid ferment of his Ventricle, by which the Particles of the narcotick Sulphur might be somewhat broken and overcome; and so by reason of this Sulphur being very much dissolved by the acid *Menstruum* of the Stomach, the highly stinking dejection of the Belly proceeded. For it is to be observed of other Bodies whilst that an acid body acts on a sulphureous, there is excited an ingrateful smell: For so it is wont to be when *Aqua Strygia* or spirits of Vitriol are poured upon the filings of Iron. In like manner also when the spirits of Vinegar is mixed with an Antimonial *Lixivium*. I might take notice of many others of this kind. But indeed 'tis not to be denied that the Particles of *Opium* do work on the dogs spirits which notwithstanding do more strongly resist the narcotick Venom than the spirits of a Man, or of other Beasts, as it is clear by the History but now mentioned; for as much as when the torpor and difficult and disturbed Respiration by reason of the spirits inhabiting the *Encephalon* being affected by the narcotick began to arise, those symptoms alloon as the narcotick matter was overcome by purging presently vanished. Besides I have known the truth of this opinion confirmed more by an anatomical experiment. Many years ago we saw about three ounces of the tincture of *Opium* done in Canary transfused into the Jugulary Vein of a little Dog, the vein being closed the dog ran about after his wonted manner and seemed little or nothing affected or changed; after a quarter of an hour he began to be a little stupefied, to nod his head, and at length began to fall into a Sleep, but not

The nature and parts of *Opium*.

In what the narcotick force consists.

It doth not operate after a like manner in all.

It hurts not a Dog so as it does a Cat or a Man.

Some Instances of this.

permitting

Part I.

permitting him when we had hindred him a while by beating, terrifying, and courting him about, at length the soporous Affection being so done away he became whole and lively enough: as it appears from hence, the opiatick Poyson is so overcome either within the *Viscera* of concoction by their ferments, or else resisted by the animal spirits themselves, as that it is not always, nor alike in all, either an Hypnotick or deadly.

As to what respects the top of the white Poppy with the seeds, of which *Diacodium*, Decoctions, Emulsions, and other hypnotick Confections are made, it plainly appears that these are far less indued with narcotick Sulphur than the concrete juice of *Opium*; and what of it is in them is much more pure and innocent. Wherefore we oftner and more securely give Remedies composed of this: For it is not fit to make use of *Laudanum* unless when for the vehemency of Symptoms *Diacodites* will do little good. Further as these contain in themselves less of virulency, they want not much preparation but being simply made by decoction, or Infusion, or expression, they may be brought into medical use: but *Opium* is seldom so simple and prescribed by it self, but is wont to be corrected and composed after a various and divers preparation, whereby it may become a safe Anodyne.

Diacodites.

Preparations of
Opium.

The preparation of *Opium* is either simple or with dissolvers and correctors joyned with it. The way of the former consists almost only in this, that its Mass being sliced into little flakes is so long exposed to the heat of the Fire or the Sun until the narcotick Sulphur being in part evaporated, the rest becomes friable and less stinking: which kind of preparation is wont to be first made before others. For whether we would endeavour to get the Tincture, Extract or Confection of *Opium*, first this previous operation is dryed and reduced into a powder. Moreover hither ought to be referred its fumigation with Sulphur by the same means as we cure Scammony: because the acid vapour ascending from the common Sulphur whilst it burns, overcomes or breaks very much the virulency of either of them both of the narcotick and cathartick Sulphur.

The Opiates of
the Ancients re-
peated.

The preparations of *Opium* with adjuncts or rather its Compositions, are divers and many; of which some were more famous and noted among the Ancients, others among those of latter days. The Opiates of the Ancients chiefly noted are Pills of Dogs Tongue, the *Requies* of *Nicolaus*, and *Philonium*, of the last of which there were four, viz. Roman, Persian, (the use of which is yet somewhat retained) and the *Philonium* of *Galen* and of *Mesue*.

The descriptions of all these are seen commonly in every Antidotary, so that there is no need to repeat them here. The reason of the Compositions of these chief Anodynes, although built upon an erroneous foundation, as to the other respects is understood well enough. For that out of a false supposition that *Opium* being cold in the fourth degree most of what they received into their *Philoniums* being hot in the same degree, viz. Wild Pellitory, *Euphorbium*, white Pepper, and others are added, of the like nature, which truly are not improperly correctors of *Opium*. But yet not as if it were their Heat opposes the frigidity or coldness of that (because indeed it is not cold but rather hot) but these sharp biting things being full of volatile Salt, do predominate over the narcotick Sulphur of the *Opium*, and break its virulency.

Laudanum in-
vented by latter
Physicians.

Renodæus of
Laudanum.

The Opiates of our Neotericks by reason of the Laudability of such a Medicine are commonly called *Laudana*; and because they take away pains, by some also named *Nepenthes*. About what time these were first made known, *Renodæus* very ingenuously complains, that there were a company of false Physicians arisen, who for the most usual Pills of Dogs Tongue, gave an opiate Confection called by them *Laudanum*, with which they promised not only to restore sleep, but also to drive away all Diseases. So much (says he) has the Encomium of this Medicine prevailed with these runagates that there is no Empirick, none so dull mediacaster or not so common a Barter who does not profess himself a *Laudanist*. Without doubt this custom however evil and most pernicious to humane Life is not yet worn out. For that also among our Countrymen there is not only a company but a swarm rather of false Chymists and Quacksalvers; every one of which boasts of his peculiar *Laudanum*, which they rashly give in every Disease and Condition, and if by chance it happens for the sick to sleep and wake again, presently they sing and are Cock a hoop, when rather they merit the gallows, for that the Pulse and Respiration being overthrown by reason

of

of their unseasonably giving an Opiate, oftentimes all hopes of the *Crisis* and of the cure is frustrated: wherefore it behoves you to be warned whoever hath any regard to his Life, that you diligently beware of these unskilful Laudanists.

Part I.

Not only the use of Opiates but much more the Invention and preparation of them are to be prohibited to Empiricks, and Quackfavers: For indeed it is the work of a prudent and learned Physician, so to temper their Venoms as that they may not be poyson, but Antidote. Wherefore *Laudana's* are not to be admitted into practice unless such as are invented by skilful men and long made tryal of; of which sort there are many extant publicly received and approved of, so that there is no need of new ones daily to be devised. The more Ancient *Laudana's* of *Paraselsus*, *Crollius*, *Quercetan*, *Hartman*, and other famous Chymists by them related and described in many *Pharmacopæas* are composed only in the form of an extract; in all which the Tincture of *Opium* drawn forth with a fit *Menstruum* is the *Basis* or ground; to which tincture others are added, viz. of Saffron, Castor, (which *Guianerus* names the *Bezoar* of *Opium*) *Species Diambre*, and such like; and so all being confused together are distilled in *Balneo*, that the *Menstruum* being drawn off, the remainder may be reduced to the consistency of Honey, in the finishing of which lastly Pearls, precious Powders, Chymical Oyls, and other things esteemed Cardiacks are added: The Medicine being so made up is given for the most part in form of a Pill,

Laudana in form of an extract.

Although these sort of *Laudana's* are efficacious enough and seem to be elegantly composed, yet the Neotricks somewhat varying the form make their confidence (whereby they may be the better taken in any Liquor) liquid; and also for that when any opiatick Pill (not more noted for its benefits than for its Harms) may be a terror to some, a dose of liquid *Laudanum* (if perhaps it seems necessary the patient refusing it) may be better hid, and being poured into other liquor may pass rather for a Cordial than an Hypnotick. And indeed concerning the use of Opiates the sick are sometimes too much and sometimes too little cautious, and so as they are in one case to be warned, so in the other they ought to be drawn to it and deceived. For the making the liquid *Laudanum* in like manner as the solid the Tinctures of the *Opium* and the adjuncts are extracted one from another almost after the same way; which being all confused and the *Menstruums* drawn off to the middle, there will remain a Medicine splendidly red or blushing whose dose is wont to be from \mathfrak{ss} to \mathfrak{ij} .

Liquid Laudana's.

Concerning these two kinds of *Laudana's*, it is a great matter with what kinds of *Menstruum* the Tincture of the *Opium* is extracted; so that the business has caused great contention among some Chymists of no small note; whilst they supposing it cold use the spirit of Wine, others on the contrary to bridle the heat of *Opium*, dissolve it in the spirit of Vinegar or in the juice of Citrons: Indeed either *Menstruum* is sufficient and are almost both alike, so it be reduced into an extract; but if in a liquid form there can be no solutive of *Opium* better to be met with than the spirit of Wine impregnated with the volatilised Salt of Tartar. For this most readily dissolves its Mass, receives a tincture like to a resplendent Ruby; moreover somewhat brings under the narcotick Sulphur and takes away its evil smell: Indeed the salt of Tartar is the best corrector of *Opium*, or rather its Antidote. Hence the opiatick Pill of a certain empirick, in which the dissolvent of the *Opium* is salt of Tartar imbued with the oyl of Turpentine, hath been accounted of no contemptible use, there is added to that Composition the powder of white Hellebore; but that only as I suppose they may assert some Paradoxes, that tamed poysons become the most precious Medicines.

what Menstruum is most fit for the making the Laudanum.

Of late years the use of a certain liquid *Laudanum* the Author of which is commonly said to be *Helmont*, hath grown famous: it hath for its *Menstruum* the juice of Quinces put into a fermentation with Yest or Barm of Ale or Beer; when this has extracted the Tincture of *Opium* being dyed with a deep yellow, which being strained and aromatized, and drawn off to the half in *Balneo*; then the remaining part is reserved for use, and is this liquid *Laudanum*, whose dose is from *gr. 15* to *20*. The other part by a further distillation is reduced into a pilulary form and is given from *gr. j* to *ij*. That liquid *Opium* I have often given with an happy success in dysenterick Affections: But our liquid *Laudanum* (which we do more often use) hath for its *Menstruum* the tincture of the salt of Tartar brought to the highest red by long digestion; and as the Tincture of *Opium* extracted by this, is the ground

The Laudanum called Helmontian.

of

Part I.

wild Poppy and
its preparations.

of the Medicine, we add for its complement Saffron, *Castor*, Cloves, and *Lignum Aloes*, the dose from 15 to 25 props.

Dogs-tongue
and its prepara-
tions.

2. After white Poppy and the preparation of it we shall speak next of the wild or erratick which hath indeed a certain hypnotick virtue but far more gentle and benign than the other; wherefore in some cases it is exceeding convenient, and one may be more secure as to its use. Of this may be had in the Apothecaries shop the Syrup and the distilled Water, which are often given with great benefit in most continual Fevers; and are thought to help in the Pleurisy with a certain specifick force; because truly they take away pains, and by stopping somewhat the Pulse depress the feverish astuation of the Blood. Further, a tincture is prepared of the flowers of this infused in the spirit of Wine, which is a famous Medicine among the Empiricks and good Women, and esteemed very good against a Surfet. The reason of whose help seems to be, that the spirits of the Wine deliver the contents of the Stomach from putrefaction, and the narcotick virtue of the Flowers provides against the assaunting Fevers.

Tobacco.

3. Having finished Meconology or Poppyology, in the Class of Narcoticks follows, Mandrake, Henbane, Cynogloss or Dogs-Tongue, Tobacco. As for the two first because they are scarce at all made use of in Medicines (unless the seeds of Henbane) I shall say nothing; but Dogs tongue breathing an odor plainly soporiferous, openly shews its narcotick Nature, and invites us as it were by the fairness of its form to the taking of it willingly: For it is a very neat Plant, having soft Leaves, and pleasantly flourishing is crowned with a bright Red and most delicate purplish Flowers: The powder of its Roots was put into and denominated that ancient and famous Opiate called Pills of *Cynogloss* or Dogs-tongue: The juice of the whole Plant gather'd about the beginning of the Spring being expressed, and depurated by a close and warm digestion, and decanted from its *Feces*, yields a clear Liquor and splendidly reddish or blushing like a Ruby. This may be used either for a *Menstruum* for the making up of narcotick Confections, or an Hypnotick Syrup may be prepared of it, or lastly being evaporated it may be reduced into an extract, from which, as out of *Opium*, by fit *Menstruums*, Tinctures and Extracts are gotten.

The effect of the
taking this.

Tobacco by right challenges a place among them and brings up the rear of Narcoticks; for although it is not put into their compositions, yet its fume being taken in a pipe oftentimes produces the same effects as they: yea, not only causes sleep it self but sometimes its contrary, waking. I shall not go about to describe the origin or manner of this custom commonly known to every one of every Sex, Age, and Condition, Indeed why I rank it with Opiates is because it doth almost the same thing with our Countrymen as *Opium* with the Turks: to wit, either of them by affecting the animal Spirits after an unaccustomed manner, and by rendring them as it were astonished, disposes them to the doing or suffering of any thing without any great sense of trouble or weariness. Wherefore virtues and effects not only manifold but diverse, yea (as I hinted but now) contrary and repugnant one to another are ascribed to the smoak of Tobacco taken at the mouth after the vulgar way. For it is ordinary said to warm us when chill and cold, also to refrigerate those that are hot, to cause or to drive away sleep, in like manner to extinguish or to excite hunger and thirst: the reason of all which consists in this, that the animal spirits being gently agitated by this *Enthymia* or inflamed smoak, and as it were provoked into certain dances, they are wholly deaf to the approaches of any troublesome thing; yea whatsoever is hard to be performed by them, or to be suffer'd, they do being almost insensible and undisturb'd: wherefore the use of Tobacco (when it may be had) seems not only necessary but profitable for Soldiers and Mariners; for that it renders them both fearless of any dangers, and patient of Hunger, Cold, and Labour. But truly it appears from hence that this greatly narcotick fume is very infestous to the spirits (before by frequent custom it becomes familiar to them) because there is none almost who at the first taking and use of it but suffers great perturbations in his Brain and nervous Stock. For when at any time one is initiated into this dry potation, presently as if he were drunk he is affected with a *Vertigo* and *Scotomia* or dizziness in the head, then a cruel vomiting and sometimes purging follows, the feet grow weak or stagger, the hands tremble, the tongue falters, or speaks at random. Oftentimes also a cold sweat and terrible swoonings follow; the cause of all which is, that the animal Spirits being

The reasons.

being as it were intoxicated by the narcotick Sulphur, are distracted very much in their whole dominion, and are agitated into *Ataxias* or irregularities; not only the first and second time, but oftentimes, tis for a very long while after their first taking it before they can be able to take the fume of Tobacco without great confusion of the spirits. But as soon as this custome becomes familiar and customary, 'tis grateful, and takes the animal Spirits with so great a witchcraft or pleasing allurements, that some had rather be interdicted meat or drink than the use of it. The reason of which is that this smoaking gently awaking or stirring up the animal Spirits at any time sluggish and sloathful, and as it were tickling them, provokes them into gentle and expansive motions, with which they are wonderfully recreated as with the drinking of Wine.

Part I.

So much for the chief Narcoticks, and their preparations, and manner of using of them, all which belong to the stock of Vegetables: but that minerals may not be thought to effect nothing, there are some who boast they have prepared out of their more hard concretes most excellent Opiates altogether without *Opium*. *Quercetan* prescribes a certain *Nepenthe* to be made out of the narcotick Sulphur of Vitriol and from the oyl of the Sun and Moon (or of Gold and Silver) with the tincture of Corals and of other famous Cordials, highly efficacious for the taking away of all pains and languors: The virtues of which Medicine I am so far from admiring that I rather think there is no such Sulphur and metallick Oyls, or that in truth there can be little or nothing gotten: Therefore returning to the real and genuine Narcoticks, we will as a complement to the work set down some of their select forms; which we will digest into certain Classes according as the Opiates have for their *Basis* either the Syrup or distilled Water of wild Poppy, or *Diacodium* or *Laudanum* extract or liquid or Pills of *Styrax* or of *Cynogloss* or lastly *Philonium*.

Take of the water of wild Poppies, of Cowslip water, of each $\mathfrak{z}\text{vj}$, of the syrup of the leaves of Poppies $\mathfrak{z}\text{ij}$, of *Sal Prunelle* $\mathfrak{z}\beta$, mingle it and make a Julep, the dose is $\mathfrak{z}\text{ij}$ or iiij , thrice a day, in a Pleurisy pains, and watchings without a Fever or any manifest cause.

Take of poppy Water $\mathfrak{z}\text{iiij}$ to vj , let it be taken by it self sometimes twice or thrice a day for the same end.

Take of *Diacodium* $\mathfrak{z}\beta$ to $\mathfrak{z}\text{vj}$, Cowslip water $\mathfrak{z}\text{iiij}$, Treacle water $\mathfrak{z}\text{ij}$, make a

The Basis of narcotick compositions.

1. The water and Syrup of red Poppy.

Potions.

Potion. Take of *Carduus* water $\mathfrak{z}\text{iiij}$, *Diacodium* $\mathfrak{z}\beta$, spirits of Hartshorn $\mathfrak{z}\beta$ to $\mathfrak{z}\text{ij}$, make a draught for the provoking sleep or sweat.

Take of *Diacodium* $\mathfrak{z}\beta$, Gascoins powder $\mathfrak{z}\text{ij}$, of *Diacodium* $\mathfrak{z}\text{ij}$, mingle it, take it in a spoon.

Take of *Diacodium* $\mathfrak{z}\text{iiij}$, Snail water $\mathfrak{z}\text{ij}$, mingle it. Convenient in a Cough, Phthisick, and the dose one spoonful at the hour of rest, and if need be, repeat it at midnight.

Take of *London Laudanum* gr. j , of the powder of compounded Claws $\mathfrak{z}\beta$ to $\mathfrak{z}\text{ij}$, with what will suffice of the syrup of Cloves, make three Pills to be taken going to rest.

2. Laudanum extract.

Take of *Laudanum* gr. j , of stomach Pills cum *Gummi* $\mathfrak{z}\beta$, make four Pills to be taken going to sleep against the Colick.

Pills.

Take of *Laudanum* gr. j to $\mathfrak{z}\beta$, of *Diacodium* $\mathfrak{z}\text{ij}$, make a *Bolus*, in the place of *Diacodium* may be added the confection of *Alchermes* or *de Hyacinth*.

Bolus.

Take of *Laudanum* gr. j , dissolve it in one spoonful of Treacle water, add of the water of Cowslips, $\mathfrak{z}\text{ij}$, make a draught.

A draught.

Take of our liquid *Laudanum* tartarified gr. 20 , let it be given in one spoonful of *Aqua mirabilis* or Cinamon water or any other convenient Water. It is good in colick pains, nephritick or gouty pains.

3. Liquid Laudanum tartarified.

Take of the Species of *Hiera* $\mathfrak{z}\beta$, of the same *Laudanum* 20 gr. make four pills to be taken going to rest, to purge and allay pains in Colicks.

Take of liquid *Laudanum Cydoniat.* gr. 15 to 20 , let it be given in one spoonful of Cinamon water the smallest for dysenterick Effects.

4. Liquid Laudanum quinqued.

Take of the conferves of red Roses $\mathfrak{z}\text{ij}$, Treacle *Andromach.* Confection *Hamech.* each $\mathfrak{z}\text{ij}$, powder of red Cloath $\mathfrak{z}\text{ij}$, *Laudanum Cydoniat.* $\mathfrak{z}\text{ij}$, syrup of Coral what will suffice, make a confection, the dose is $\mathfrak{z}\text{ij}$, every fourth or fifth hour in very bloody Dysenteries with pains.

Part I.

5. Pills of Sty-
rax.And of Cyno-
glofs.

6. Philonium.

An antihypno-
tick Remedy.

Take of Pill *de Styra* gr. v to vj, of the milk of Sulphur $\text{S}\beta$, of the oyl of Aniseeds gut. j, of the Balsom of *Pern* what will suffice make three Pills to be taken in Coughs, Asthmas, &c.

Take of the Pills *de Cynogloss* or Dogs-tongue gr. vj to viij, make two Pills to be taken going to sleep for the same Intentions.

Take of Roman *Philonium* Sj to Sij , conserves of Cloves 3β , mingle them, and make a *Bolus* to be taken going to rest. Convenient in the Colick, in a cold Temperament.

After having sufficiently explicated the narcotick Remedies, we should next speak of Medicines merely Anodyne: viz. which not by profligating or by stupefying, but only by softning and by stroking do gently compose, and flatter into rest the animal Spirits being any way disturbed or grown fiere or angry. But it ought to be manifest concerning the $\tau\theta$ $\text{S}\pi$ of these, whether there are any such in truth, before we make any disquisition of the $\delta\text{S}\pi$ or how they are: For besides this, that Fomentations, Cataplasms, Liniments, being outwardly applyed, and Clysters injected into the Intestines sometimes do allay pains, I have not known any other effect to be performed from those kind of mere Anodynes at least taken inwardly at the mouth: Wherefore it does not seem worth the while to trouble our selves about the *Aetiology* of these to which there is no faith to be given, for the conciliating sleep or for the allaying of Pains when they are very urgent.

But as we have fully discoursed hitherto of Opiates, and of their preparations and ways of operating: according to our former method now should follow to be handled, the contrary Medicines to these, or Antihypnoticks, viz. which by driving away sleep too much troublesome do render us wakeful; had I not fully performed this task formerly in the Pathology of the Brain (where we have treated of the Lethargy and other soporiferous Affections and their Remedies) so that there is no need to repeat here the same again. But since that both there and in other places hath been made by us frequent mention of a certain Liquor called Coffee, highly efficacious for the driving away the *Narcosis* or stupefyingness; it seems not to be altogether from the purpose to speak here a little more (than we have else where hinted) concerning this Drink and the effects of it, and the reasons of its acting. It will be from the purpose to discourse of its Antiquity, and of its common use now among the Turks, and formerly among the Arabians and other Eastern People: but that this Drink also of late years is brought into custom by our own Countrymen, and that there is almost none but understands well enough by experience its efficacy and virtue for the driving away of sleep, we will therefore inquire into the reasons of this so well known and experienced Effect. We have said (in the Chapter of Waking) that the reason of it consists in this, that this Drink insinuates adust Particles (which we may find both by our taste and smell that it abounds with) into the blood; and from thence into the nervous Juice, which for that cause both by their incongruity and their mobility or inquietness, detain the Pores of the exterior Brain continually open, and by some other way of fettering them add to the Spirits, laying aside their *torpor* or drowsiness, certain furies and provokings by which they are excited to the longer performing of their duties: For indeed to the inducing of sleep these two things are necessary, one or the other of which is still first or rather for the effecting it. To wit, it behoves the Pores and all the passages of the exterior brain or its *Cortex* or shell to be stuffed very much and filled full, and so to be shut up by the Liquor, there as it were stilled forth and overflowing from the Blood; then besides for the causing of this effect there is need that the animal Spirits excluded from the Pores, and those passages, and besides oftentimes burthened with nutritious and serous Particles, being given to Idleness, should betake themselves to the middle of the Brain. Concerning this task requisite to sleep there is not still one and the same order. For sometimes the animal Spirits first and of their own accord relinquish those spaces the nervous juice by and by rushing into the same voyd places; but sometimes the nervous Humour with the serous being more plentifully poured in, the first invades those passages driving their spirits thence against their wills and compelling them inwardly.

But the operation of Coffee seems contrary to both effects. The adust Particles highly active and ready being delated into the Blood not presently after the drinking it, do somewhat fuse its Liquor, the serous water being detrued towards the

Coffee drink.

Its effect.

Its Aetiology
delivered.

Part I.

the Reins and habit of the Body; further they driving towards the brain easily open its Pores which they detain very open with their mobility; then they growing to the Spirits do uncloath them from all other Particles both gravative or nutritious, and so stir them up on every side being light and nimble, and make them to be stretched abroad thorow the whole compafs of the Brain freed from any heavy oppletion and obftruction.

In the mean time notwithstanding, whilst the Spirits being continually and unweariedly exercifed after this manner, are deprived of the accefs and affimilation of the nervous juice, plenty of them are not fufficiently renewed after the wonted manner. Indeed the old veterane Spirits are rendred more agil and nimble, but the fupplies of the new ones are diminished. Hence as it eafily appears that this drink though moft commonly ufed, and very profitable in fome cafes, and very medicinal; is to others perhaps very hurtful, or lefs healthful. Indeed that it is fo, not only reafon but alfo common obfervation every where dictates, for as much as the great drinkers of Coffee become lean, and oftentimes paralytick and obnoxious to an impotency to *Venus*. The firft effect is fo frequently and every where known, that I have for that reafon only forbid many the drinking of Coffee becaufe it difpofes to leanness,

*Its benefits and
incommodities
noted.*

For that as the Blood by the exceffive and continual ufe of it is made more fharpe and torrid, it therefore becomes lefs able for nourifhment. But as to the Affects of the Brain or nervous Stock, I do frequently prefcribe this drink fooner than any thing elfe for their cure, and therefore am wont to fend the fick to the Coffee houfes fooner than to the Apothecaries fhops.

*It makes people
lean.*

Indeed in very many cephalick Difeaſes and Sickneſſe, viz. great Headaches, *Vertigo*, Lethargy, Catarrhs and fuch like, where there is with a full habit of body and cold or lefs hot temperament and wateriſh blood, an humid brain, but a *torpor* and flothfulneſs of the animal Spirits, the drinking of Coffee is often taken with great benefit, for continually drinking it wonderfully clears and illuſtrates either part of the Soul, and diſpels all the clouds of each function: but on the contrary, who are lean and of a bilous or melancholy Temperament or have a ſharpe blood or torrid, a hot brain or animal Spirits too much ſtirred up and unquiet, ought to abſtain wholly from this drink; for that it rather perverts both the ſpirits and humours and renders them alſo weak and altogether unable for the performing their functions. For I have obſerved many not indued with plenty enough of ſpirits, and obnoxious to the Headach, *Vertigo*, the Palpitation of the Heart, the trembling or numneſs of the joynts, to have become worſe preſently upon the drinking of Coffee, and ſuddenly to have felt an unwonted *languor* in their whole Body.

*It diſpoſes to the
Pally.*

The British Empire

The British Empire, at its greatest extent, covered more than a quarter of the world's land area and included a vast population. It was a collection of territories and countries that were under the control of the British Crown, either directly or through local rulers who were loyal to the British monarch. The empire was built up over centuries, starting with the acquisition of Ireland in the 12th century, followed by the conquest of Wales and the establishment of the Kingdom of England. The empire expanded further through the discovery of the Americas in the 15th century, the establishment of trading posts in Africa and Asia, and the acquisition of India in the 18th century. The empire reached its peak in the late 19th and early 20th centuries, when it included territories in North America, the Caribbean, Africa, Asia, and the Pacific.

The British Empire was a source of wealth and power for Britain, and it played a major role in the development of the world. It provided Britain with raw materials and a market for its goods, and it helped to spread British culture and values around the world. The empire also played a role in the development of the world's infrastructure, including the construction of railways, roads, and ports. However, the empire was also a source of conflict and controversy. It was often criticized for its role in the exploitation of its colonies and for its involvement in wars and conflicts. The empire eventually began to decline in the mid-20th century, as many of its colonies gained independence. Today, the British Empire is a thing of the past, but its legacy is still felt in many parts of the world.

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THE

PHARMACEUTICE RATIONALIS:
OR, THE
OPERATIONS
OF
MEDICINES
IN
Humane Bodies.

The Second Part.

With Copper Plates describing the several Parts treated of in this Volume.

By *THO. WILLIS*, M. D. and *Sedley* Professor
in the University of *OXFORD*.



LONDON,

Printed for *Thomas Dring*, *Charles Harper*, and
John Leigh, Booksellers in *Fleet-street*, 1679.

THE ARTS AND MYSTIC

OF THE

MEDICAL

ARTS

OF THE

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THE
P R E F A C E
TO THE
R E A D E R.

Since first I began to consider the Operations of Medicines in humane Bodies, and their manner of working, and for some time meditating upon the entire Subject, at length published an Essay of the Rational Curatory part; I became affected with so vehement a desire of farther prosecuting that Speculation, that in all spare hours, (to wit as frequently as I might be vacant from my practice) I could hardly intend or admit thoughts of any other thing: And that not so much that I might please others, as by often turning in my mind, and writing my Meditations of this Subject, I might be better instructed to prescribe to my Patients. For certainly the not duely weighing the Reasons by which Medicines operate, renders all Physick to be Empirical, and to be governed rather by Chance or Fortune than by Advice; and it frequently comes to pass, that a Medicine rashly administered, is but casting a Die for a mans Life. Wherefore, that I might satisfy my self, and practise Physick (as is usually said) with a safe Conscience, it pleased me to bestow more labour in the search of the true Reasons of physical Energies and Efficacies. And because in this Treatise, we chiefly consider Medicines, respecting certain private parts or Regions of the body, and their proper Diseases, therefore we have endeavoured in the first place to perform these three things; viz. First that a most accurate Anatomical Description might be given of the parts, (if not already extant) whose distempers and remedies are treated of, as to the Fabrick and uses of all their Vessels. Wherefore, turning over the Breast and Lungs, and most diligently viewing their inward recesses and apartments, what thing soever observable either the Ancients or Moderns have

The Preface.

published about these, and whatsoever further by Knife or Microscope we have detected, we have here set forth. In which task, as formerly in some others of the same nature more exactly done, I must confess I owe much to the sedulous labour of my most learned Friend Dr. *Edmund King*, and to his most dexterous Dissections. And really I esteem it so necessary to lay the History of the parts, as a foundation to our Rational Curatory Method, that without it I did believe the whole Superstructure would be merely phantastical and altogether unstable, or at least unprofitable. For surely, either to practise Physick, or demonstrate its Operations on humane Bodies, without an exact knowledge of the parts and passages, on which, and by which they work, would seem equally absurd, as if a Philosopher ignorant of Mechanical affairs, should go about to unfold and explicate the Artifice and cunning Workmanship of a Clock moving of it self, according to the Theory of Natural Motion delivered by *Aristotle*. Wherefore we have view'd with most exact diligence, in the first place, the Subjects of Physick, or the places of Operation in our Bodies, as the Circuit in which we are to move. Then secondly we have not been less solicitous, that according to the Phenomena of all parts lately detected by Anatomical observation, the true and real Hypotheses of Diseases should be built, whereof we have designed the Remedies; that not still persisting in the thread-bare paths of Ancient Physick, by a certain blind and implicate obsequiousness, after the manner of Beasts, according to the proverb, to be only guided by our Ancestors footsteps; but deriving the Causes and formal Reasons of Diseases from their very Springs, we every where endeavour to shew, from what Disposition of Blood and Humours, from what affection of Animal Spirits, from what habitude of Fibres, and of other solid parts, every disease proceeds. And these things so premised, and laid instead of a solid Foundation, at length in the third place, that the structure of our Curatory method being rightly compacted, may happily rise up and firmly consist, we have gathered together most of the Medicines respecting most of the private parts and regions of the body, and the peculiar Distempers thereof, viz. both Simple and Compound, both Old and New, both Dogmatical and Empirical, gathered out of the Physick-books of every Age, as also those chiefly celebrated by Quacks and Nurses; more choice forms of all which, or at the least

The Preface.

least the chief of them, and manner of using, we have aptly assign'd, and annex'd the reasons as to the Preparations, as also the Operations and Effects of them. But that all is not comprehended in this Tract that was omitted in the former, which yet I had hoped might have been, happens from the plenty of matter, and the bulk of the work encreasing upon our hands: For assuredly, it is more than the task of one Man or Generation, to exhibit a compleat Curatory Method, and absolute in all points. For if this Disquisition were more fully instituted as to its Latitude, not only all the *Materia Medica* (which is almost infinite) but also the whole Body of Physick offers it self. Wherefore these our Attempts court not the name of Treatises, but of Essays. Truly it will not be needful for many Physicians, especially those who neglect the Phænomena of Nature, being intent only on their Practice and Gain, to be learned about the Reasons of all Remedies: but to the genuine Sons of Art, this will be of value, if not to direct, at least to incite them to the Knowledge and serious weighing always of those things they take in hand. And if these small endeavours shall instigate others better to polish that Study, whatsoever Reviling I may reap from the malevolent and envious, it shall never repent me of my labour. For when I shall be well conscious to my self, that I have not suffered my Faculties although small (as the Talent entrusted with me by God Almighty) to perish through sloth, nor suffered them to be buried in the earth, but that they may be rendred with some Interest beside the Principal, it will much please me, nay, I shall seriously rejoyce and triumph.

POST-

POSTSCRIPT.

WHile these were Printing, the most sad message arriv'd, that the Author, most worthy of Immortality, oppress'd by the irresistible assault of a Pleurisie, is departed from among the Living; neither did the Arts profit their Master, which did all others. The Reader will pardon us, if we for a little space celebrate the Funeral of so Sacred a Memory, nor esteem it superfluous to bear in a few words, what manner of person he was who wrote such things: yea he will rejoyce to understand that he was equally Good as Learned, that he also exercised himself in the Practice of Piety, who was most conversant in that in Physick.

The matter requires a just Commentary, but we shall briefly propound what at first came into our sudden thought, while our mind was surpriz'd with so unexpected an Accident.

Extracted from an honest Family, he had a Father educated in ingenuous Studies, who after he had gone Master of Arts in the University of Oxford, being taken with the retiredness of the Countrey, repaired to a Possession he had near the same City, and solely attended his Domestick Affairs, and maintenance of his Family: being enough deserving of the World, who begat such a Son. But He, the Civil War raging, being snatcht away by the Contagion of a Camp-Feaver, left his Son an Orphan, near about twenty years of age, placing the first Rudiments of his Studies in Christ-Church; who being called to take on him the care of an Inheritance, for some time remained in the Countrey, but harrassed by the IncurSIONS of the Rebels, who were possessed of a Garrison strong enough Five miles from thence, and every where Plundering, he betook himself again to Oxford, being the Tents of the King as well as the Muses; where listing himself a Souldier in the University Legions, he received Pay for some years; untill the Cause of the Best Prince being overcome, Cromwell's Tyranny afforded to this wretched Nation a Peace more cruel than any War. From thence, the Church being trampled on, and Divinity together with Divines suppressed, he applyed himself to the study of Physick, in which, in a short time he made eminent progress. In the mean time being nevertheless addicted to the study of Piety, (whereof it was a considerable demonstration, that when the Liturgy of the Church of England was thrust out of the Church, and none could be present scot-free at those holy Offices after the ancient manner) he entertained Religion then a Fugitive; and allotting part of his House for Holy uses, brought it so to pass, that
Assem-

Postscript.

Assemblies, and Publick Prayers, and other Offices of Piety were constantly performed according to the Rites of the Church of England. In the mean time he writ and published those most excellent Tracts by which he first became known to the World, viz. Of Fermentation, of Feavers, and of Urines.

At length the King restored, and access opened to University Degrees and publick Employ, he proceeded Doctor, and was publickly declared Professor of Natural Philosophy, which Profession he did adorn with the highest praise; Moreover, his Anatomy of the Brain, and his Treatise of the Scurvy, and of Convulsions, were published.

But about the Year 1667. being called to London to practise Physick, it is incredible to relate, how soon, and with how great Commendations he grew famous, especially being so composed by Nature and Custom, that he could not recommend himself by words composed to deceive, or the cunning Arts of Mountebanks. But though he spent whole dayes and nights in care of the Sick, he was yet at leisure to adorn his Art by composing Books, from whence among a thousand Interruptions he published these Treatises, of the Accension of the Blood, and of Muscular Motion, of the Soul of Brutes, of the Diseases of the Brain, and the first part of his Pharmaceutice Rationalis, and at length the other which we now present. All which, with the Authors Animadversions, and writings unpublished, being collected into one Volume, and committed to the care of the most faithful Apothecary Mr. J. Hemming, we hope some time to print here.

Moreover, the same care for Divine Worship was still impressed on this most Pious Soul; and since he could not be present, by reason of Employ, at the Canonical Hours at the Publick Devotion in the Parish Church where he dwelt, he procured the Sacred Offices of the Church to be there celebrated early in the Morning and late in the Evening, and for the most part was constant at them, whatever Business was repugnant. And seeing this Institution profitable to many in the Neighbourhood, who were likewise all day detained about Commerce and Trades, he endowed a Priest with a fit Salary at his Death, to discharge that Function for ever.

*But small was this proof of his excellent Pious temper. Although no Person more frugal and attentive to his Employ, yet none more munificent, denying all things to himself, yet denying nothing to the Poor and helpless. Besides what he bestowed with his own hands, he provided Almsgivers and Dispensers of his Charity every where in the City, Countrey, and in the University. I speak what I know by frequent experiment; one might easier have received from him, for a fit object of Charity, an hundred Crowns, than have extorted as many farthings from most others. And though any one might justly impute the large Revenues he acquired, to his indefatigable Diligence and constant Frugality, yet I believe it rather to proceed from
his*

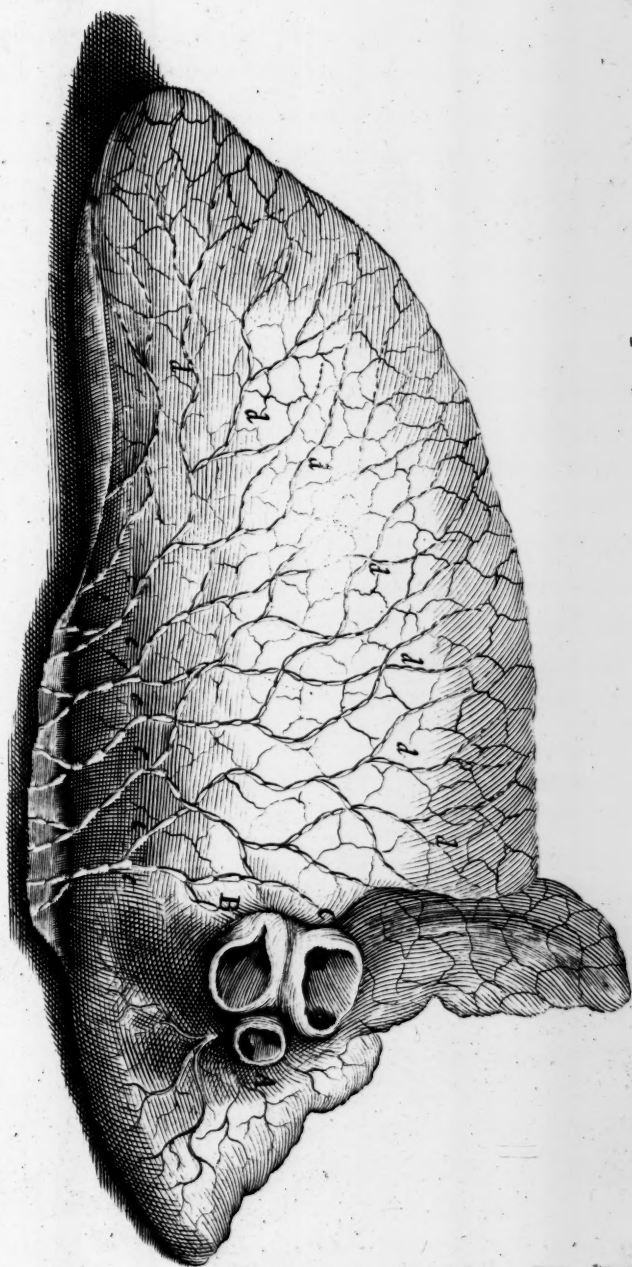
Postscript.

his bountifull Largeſſes, and the Divine benediction thereon. From the beginning of his Youth to the laſt period of his life, he was Maſter of no ſumme of Money which he accounted his own, untill he had conſecrated ſome conſiderable Portion of it to God and the Poor: And when a few dayes before his laſt, which I muſt ever lament, we conſerr'd together, (as if he had foreknown his approaching Death, and being more ſolicitous about the Poor than his own Offspring,) he diligently adviſed about ſtating theſe Accompts.

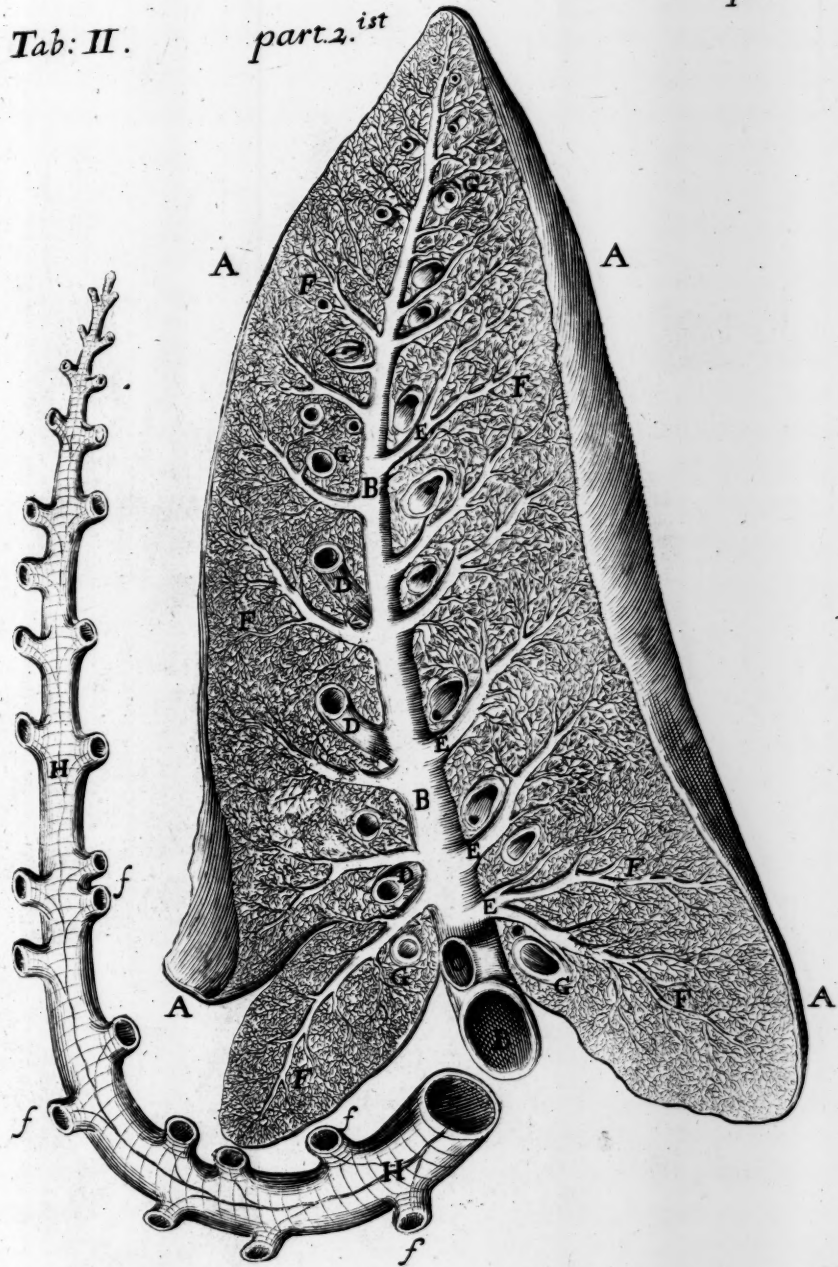
I omit here to decipher, how undiſturbed he was in Adverſity, and how temperate in Proſperity; how modeſt in the higheſt Fame for his Learning; when unworthily provok'd, how prone to forgive Injuries; how faithful to his Prince to his death; how obedient to the oppreſſed Church; how candid and ingenuous in the Profeſſion of his Art; how indefatigable in his Studieſ, how ſparing in his Speech, and how much a Chriſtian in the whole ſtate of his Life. To finiſh all which according to his deſerts, is not the work of one hour or Paragraph. In ſhort, he was conſtantly exerciſed in Prayers, Studieſ, Labours, Almes, and Watchings; at length being near Fifty ſeven years of Age, in the beginning of November he ſeemed troubled with a Cough (now the Epidemical Diſeaſe of the time) which (while it was thought light and inconfiderable) ſuddenly paſſed into a Pleuriſie and Peripneumonia. And when this moſt expert Perſon was not relieved by frequent Bleeding and diligent taking of Remedies, himſelf perceived the Period of his Life to approach, (his Friends hoping better;) and after three dayes his Houſhold affairs being ſettled, and having taken the Viaticum of the Holy Eucharift, and being received into the Peace of the Church, he commended his pious Soul to God, having his ſenſes entire to the laſt breath, and finiſht his moſt exemplary Life with the like Death.

THE

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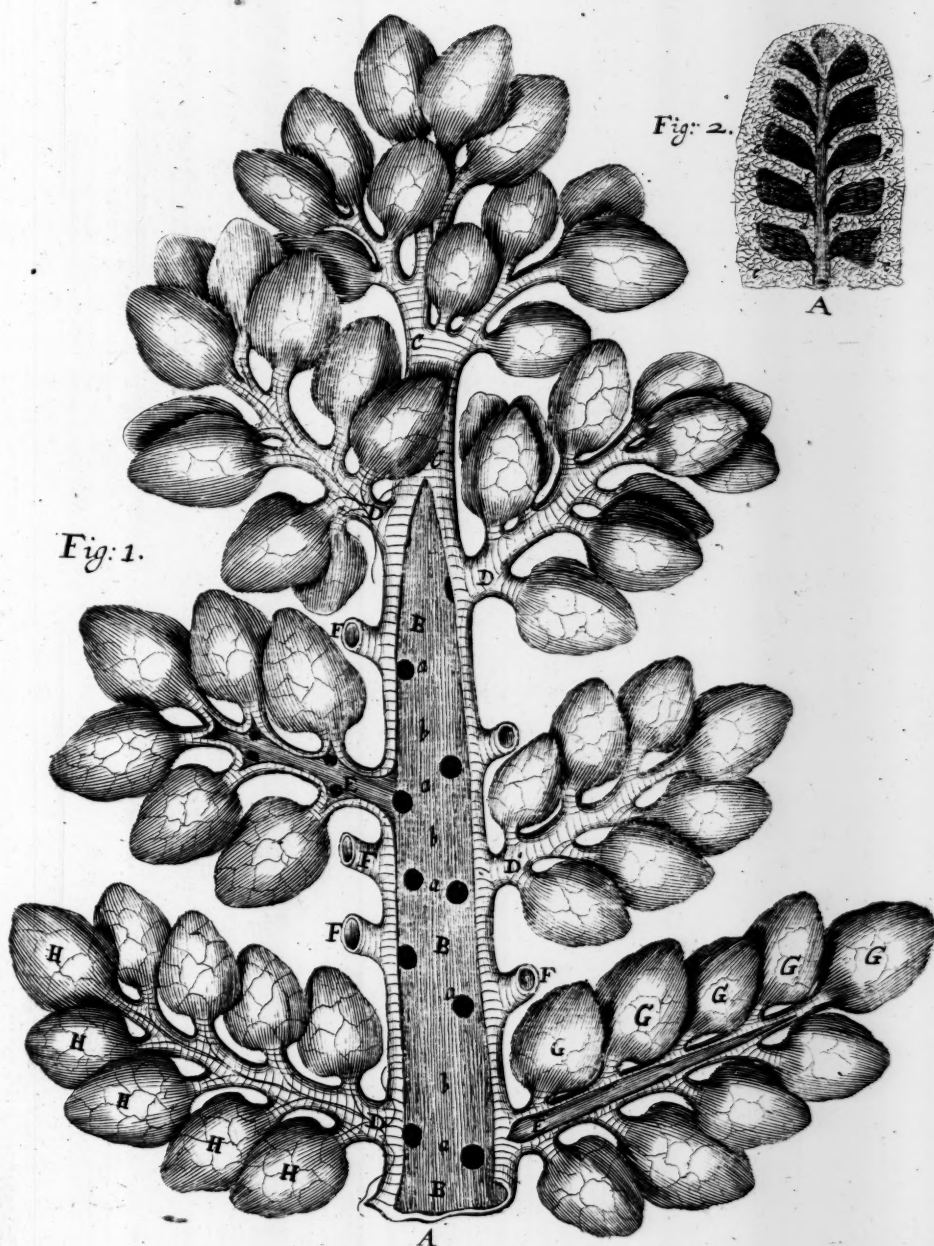


Tab. I.



Tab: III.

part 2.^{ist} Sect. 1. Cap. 1.



Tab: IV.

Sect. 1: Cap. 1.

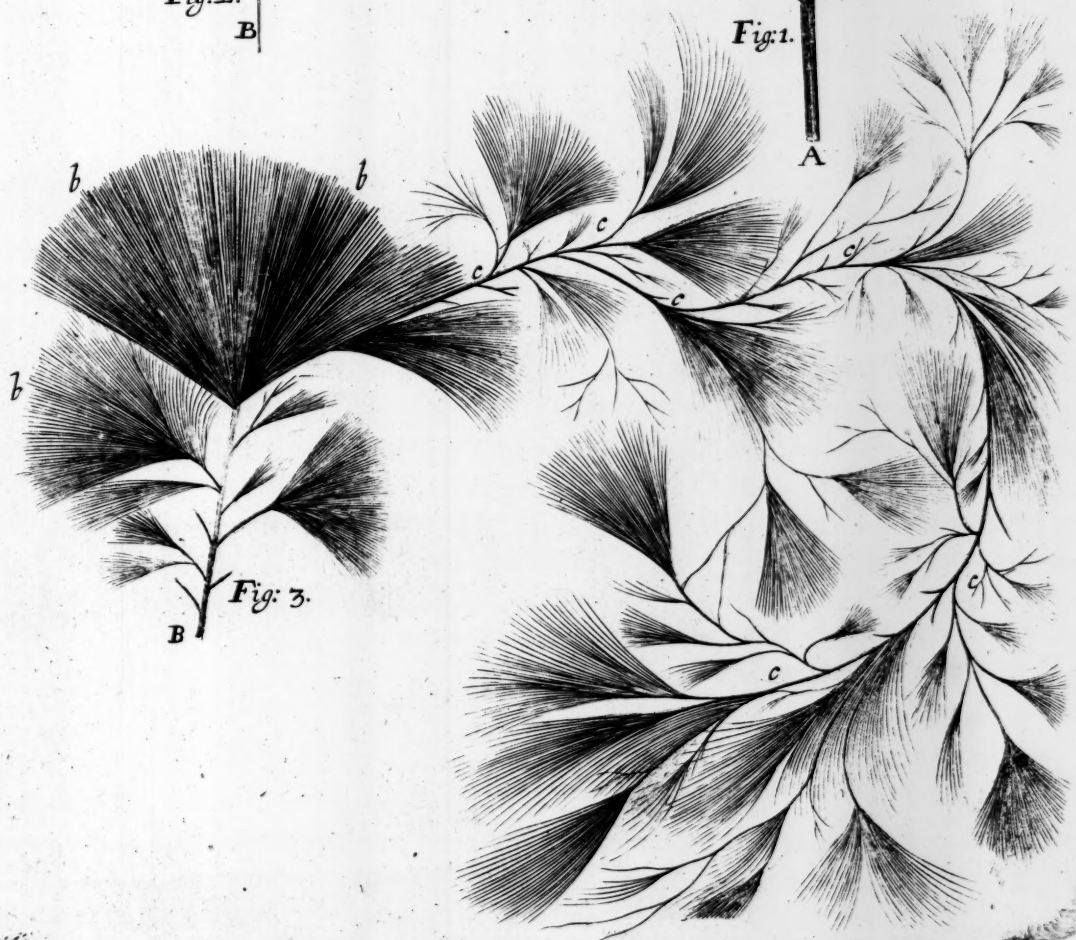
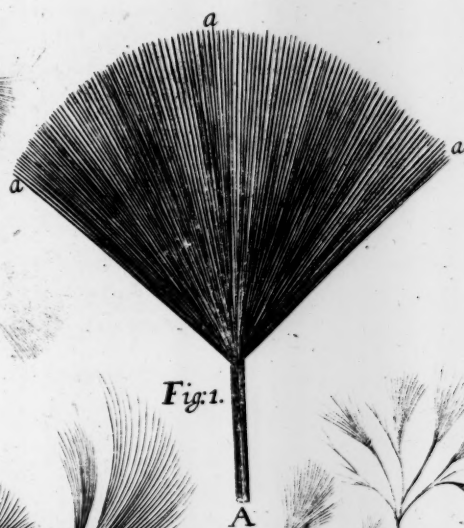
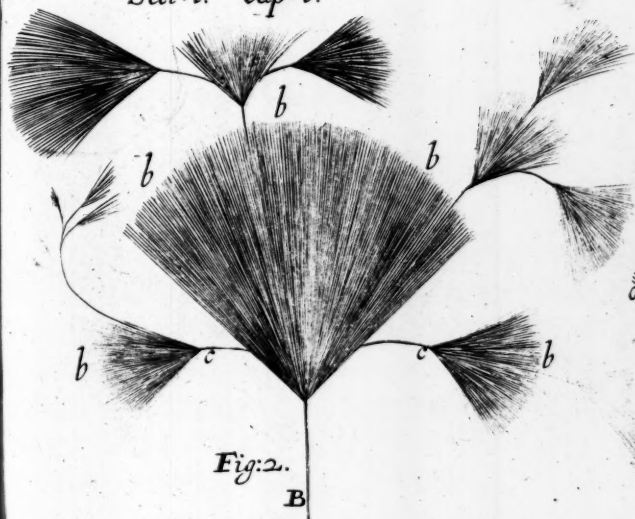
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Tab. V.



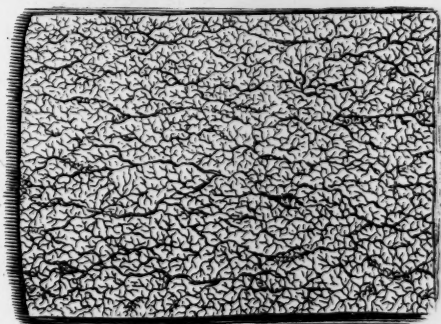
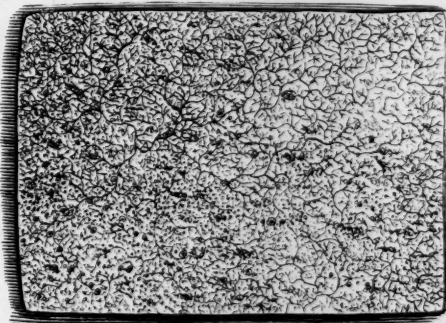
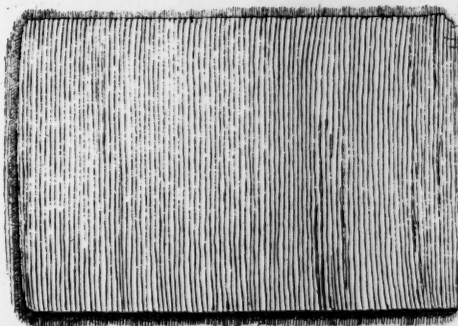
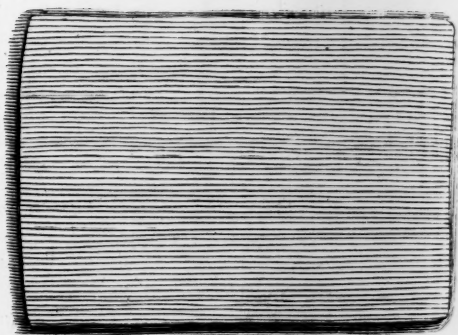


Fig: 2.

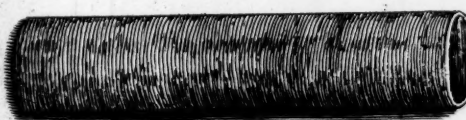
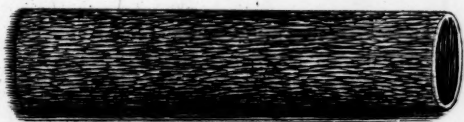
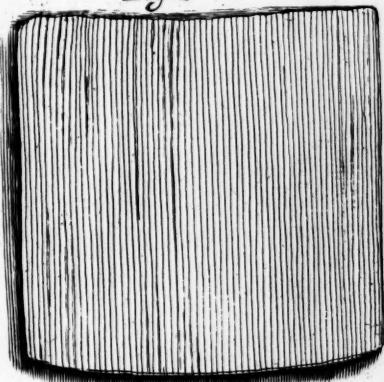


Fig 1



Tab: VII. part. 2.^{1st}

Fig: 3.

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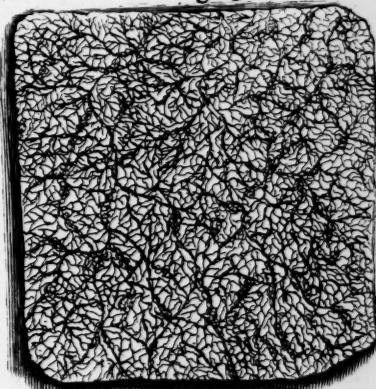


Fig: 4.

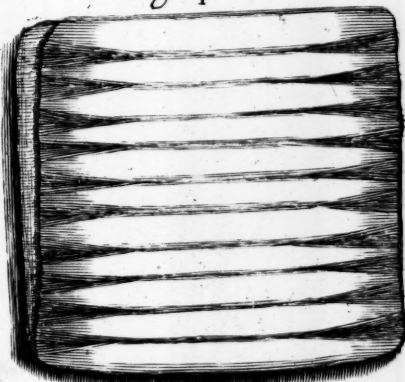
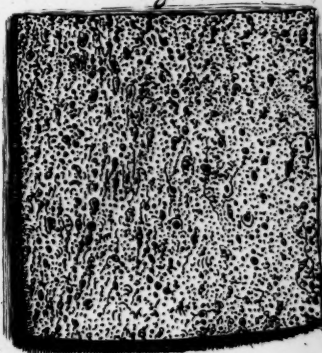


Fig: 2.



Sect. i. Cap. i.

Tab. VIII part. i.

Fig: 1.

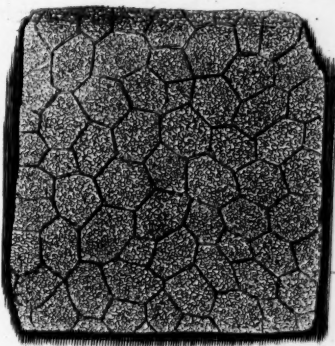
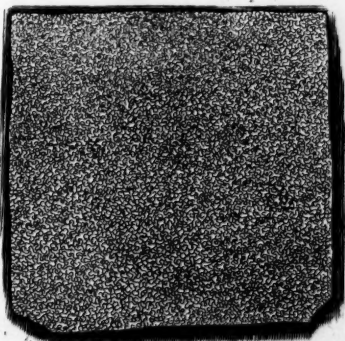


Fig: 2.



Fig: 3.



I

THE
SECOND PART
OF
PHARMACEUTICE RATIONALIS,
OR OF THE
OPERATIONS
OF
MEDICINES
IN
HUMANE BODIES.

SECT. I.

Of the Medicines of the Thorax.

CHAP. I.

Of the Organs of Breathing and their Use.

IN the former Treatise having essayed to explain the reasons of every Medicine, for the most part we have toucht only upon general Medicines, namely which excite some Evacuation, or recreate and restore the fainting Spirits, or calm those which are too much raging and unquiet: But moreover there are many other Remedies, and those of several sorts, which are supposed to have respect to some peculiar part of the Body, or some particular Disease, and to be appropriated to those ends by a certain kind of specific virtue or operation. Now as concerning both the *Uses* and *Effects* of these, at least the chief of them, *viz.* whether it be really so, and for what reason it comes to pass to be so, it seems now worthy to be inquired into: And first of all we will treat of the Medicines of the *Thorax*, *viz.* those that are wont to be prescribed against the Cough, Phthisic, Catarrh, Asthma, Dyspnoea, and other Diseases of the Breast.

The Authors purpose in the present work.

But since the reasons as well of these Diseases as of medicinal Operations in healing them seem very abstruse and most difficult to declare: therefore before I enter upon this task, something ought to be premised about the parts themselves, as well touching their uses and ordinary actions, as their sicknesses or preternatural affects. As to the first, the parts of the *Thorax* are either principal, as the Heart and Lungs,

The parts of the Thorax.

with

with the Vessels appendent unto them; or subservient, as the Membranes and Muscles, with the Diaphragma; as likewise the Ribs, with the Vertebra's; the Pneumonic Vessels, with the nervous Fibres and Glandules. The consideration of the Heart and its Vessels doth not properly belong to this place, because not so much the sicknesses of the Breast alone as the general sicknesses of the whole body are usually reckoned amongst its passions. Whereas therefore the remedies appointed to cure the diseases of that region, have special respect to the Lungs, and to the other Organs of breathing serving them; therefore first we will describe the fabrick and use of these parts, then their diseases afterwards, together with the method of cure, and remedies; and lastly endeavour to add the reasons of all these.

The substance of the Lungs altogether membranous.

The substance of the Lungs was always accounted by the Ancients, and mostly hitherto by modern Authors for flesh and a Parenchyma, like the frame of the other bowels; which notwithstanding was accounted lighter and spongy (for as much as it was apt to be distended much by air puff in, and to float upon waters.) Moreover, whereas the Lungs taken out of an Embryo look red, and sink in water; and the Lungs of some grown persons being boiled, appear compact enough and more solid; almost no man doubted but they consisted really of flesh: until lately the renowned *Malpighius*, a most diligent Searcher of Nature, found those parts to be altogether excarnaceous, and merely membranous; "and therefore he judges the bulk of the Lungs, if the Nerves and certain Vessels be separated with the branches of the *Trachea*, to be a certain heap of little Bladders, and those small Bladders every where stretched out and sinuous, to obtain such position and knitting together, that an entrance lies open into them from the *Aspera Arteria*, and so from one into another, until at length they all end in the Membrane inclosing the Lungs. And truly that it is so, he makes clear to sense by an Experiment. For let a Lung be taken out hot, and let water be so often cast by a Syringe into the Pneumatic Artery, as till the whole frame appear somewhat white, and almost transparent, the blood being clean washed out; afterward this water being squeezed out by pressing, and the air let in by the Wind pipe, and put in, let the Lung so filled be dried: and it does not only, whilst exposed to the light, outwardly shew transparent little Bladders; but being inwardly cut, it presents a white heap of little Bladders to the eyes. Besides, having viewed it with a Microscope, he discovered a certain wonderful Net, binding and knitting together every one of those little Bladders; which Net consists of the minute productions and branchings of the Artery and Vein; which Vessels circulate the blood by the small and crooked passages, and by the many turnings of the Pipes.

Consisting of almost infinite Lobes.

The most renowned man hath found out beside these little Bladders for the most part constituting the frame of the Lungs, a new and more admirable furniture of this Bowel, viz. he shews plainly the bulk of the Lungs to be blown up by almost infinite lobes girt about with their proper Membrane, which being endued with common Vessels, grow to the small twigs of the *Aspera Arteria*: the insertion and situation of which kind of little Lobes are manifold, as being sometimes affixt to the Basis of the *Trachea*, sometimes to the Ribs, or to its Coste; also according as they end in the outward and plain superficies, or in the corners of the Lungs, and according as they ought to have a due position, knitting and inter-spaces among themselves, rightly to fill up the frame of the Lungs. The little lobes out of which each lobe of the Lungs is made up, in the third Table are accurately and to the life expressed.

Their little branchings.

Certain inter-spaces distinguish these little lobes (which manifestly appear in a larger Lung or in any other half boiled) which (as the renowned Person hath observed) are not bare cavities or empty spaces, but they have many Membranes spreading from the little lobes, some parallel, some angular, and are also covered with many Vessels, so as these inter-spaces are certain membranous little bladders, yet transparent and most thin. If you lightly open in one single lobe of the Lung one of these inter-spaces with the point of a knife, and shall blow into it by a small hole through a Pipe, presently that whole lobe will be very much extended, every inter-space being puff up; and then if you bring this frame to the light, the inter-spaces being made transparent, do sever by great intervals every lobe very conspicuous; and so every rank of the lobes will appear like a Polypody leaf, and under the same figures, as *Malpighius* hath described, and are represented in Fig. 2. of our third Table. But when the little lobes are filled and extended by liquor easily congealing cast into

into the passages of the *Trachea*, the appearance thereof is somewhat diverse, and seems in the form of Grapes, as is expressed in Fig. 1. of the same Table. The Veins and Arteries every where accompany this production of the *Aspera Arteria*, and extend themselves through the whole substance of the Lungs by a certain knitting and alike branching. This is plainly perceived by a pleasant sight, in a lobe of the Lungs being emptied and turgid, Quick-silver being cast into some of the Vessels, and others filled with a coloured liquor. But in dissecting the living, another sort of Vessels; *viz.* Lymphæducts are manifest to the eye to be spread through the whole Lungs: and we have in another place clearly enough shewn, both very many Nerves and nervous slips every where to be distributed through them. Besides these parts, and the primary or chief vessels of a Lung, some others, and those as it were secondary, are to be observed. For the Pneumonic Veins and Arteries are endued with other sanguiferous Vessels springing from the *Aorta*, moreover with Glandules, and likewise with Fibres as well nervous as moving; and the Wind-pipe is endowed with every one of these, and cartilaginous ones besides.

The Lymphæducts and nervous slips.

Whence we may infer, that the entire frame of a Lung is merely fistulous, and compacted of Pipes of several kinds and magnitude, and variously and most intricately disposed: which although they may appear wonderfully complicated, and many ways twisted and wreathed, are yet every where continuous, and being stretched out with a mutual respect to one another, do hither and thither in good order and regularly convey and dispose the air, the blood, the *Lympha*, and animal Spirits for some accessory uses. To describe as it were with a Pencil this bulk of a Lung, together with the branchings, separatings, and mutual complications of all its Vessels, would be no less difficult a task than to trace the several threads of a harl of silk, and their respect one to another. Nevertheless, that both the Pathology of the *Thorax*, and the cure, may be duly known according to our design, it seems to be material to recite here all the Vessels of the Lungs one after another, and to deliver as well their descriptions, as their preternatural uses and diseases, to which at length the Therapeutic Method shall be subjoyned. And these are the Vessels of which the entire fabrick of the Lungs consists, the Wind-pipe, with the *Bronchia* and little Bladders, Arteries, Veins, Lymphæducts, and Nerves, to which may the parts and appendices of those Vessels be added, *viz.* the Coats of the greater Vessels, which are endued with other sanguiferous Vessels and Glandules, and also with nervous Muscles and Fibres.

The Vessels of a Lung.

Therefore as to the chief Vessels of the Lungs, although all these, by reason of their mutual offices, communicate among themselves with a wonderful affinity; yet the Arteries and Pneumonic Veins attend on the *Trachea* and its partitions the most exactly; for the branches and sprigs of every one of these springing alike from their respective stocks, and stretcht out to and fro, go on every where with like pace; so that the *Trachea* and its branches are always in the middle, above that the Vein, and beneath the Pneumonic Artery are carried, and all are distributed with an equal and sociable branching: and the sprigs and branches, sent from each of them, are presently applied to their like, and are interwoven like wonderful Nets, of which the texture of the Lungs is almost totally constituted. It will be impossible to describe the spreadings out and various complications among themselves of all these going on together, as to the lesser sprigs and slips; yet if you will cast into every vessel apart Quick-silver, hot and flowing Gypsum, Wax mingled and made liquid with Oyl of Turpentine, or some such matter, which will extend all or the chief passages, and continue them stufft, then you may exactly enough represent the figure: and after that manner the frame or texture of the whole Lung may be conceived, each being described by it self and apart. Wherefore upon these and all other Vessels and parts of the Lungs we will treat in order; and first of the *Trachea* or Wind-pipe.

wait on the Trachea.

The Wind-pipe or *Aspera Arteria* is a Pipe somewhat long, consisting of Gristles and Membranes, which beginning from the Throat or lowest part of the Jaws, and leaning on the Gullet, and descending into the Lungs, is dispersed by manifold little branchings through their whole frame. It is divided into two parts by the Ancients, *viz.* the upper, which is called the *Larynx*, and the nether commonly called *Bronchus*; to which a third or lowest is added, by *Malpighius* called *Vesicularia*, or the bladdery one.

The description of the Trachea.

The former of these, which is the beginning of the *Aspera Arteria*, doth chiefly

The description serve of the Larynx.

serve for vociferation or loud noise, formed of many and various Grilles, to which also are adjoynd proper Muscles; the description and use of all which are so exactly delivered by Anatomists, that there is no need of dwelling longer on the description: we only advertise for methods sake and by way of abridgment, that the Larynx contains some greater Cartilages of divers forms, and some uniform; the former, by reason of resemblance, bear the denomination of *Epiglottis*, the Buckler-like Cartilage, the Ring-Grille, and *angularis*. To this last doth succeed a continual rank or row of Cartilages, fashioned altogether after the same figure and manner; every one of which, whereas they resemble a circle, but not compleat, are disposed after such a sort, as if one so compose many wooden Rings, that there should grow up from the sides of them, by laying a good many one upon another, a certain Pipe as it were with Ribs. These circular Cartilages are equally distant one from another in their whole passage, and are knit together by the benefit of an inner Membrane (which fills up the spaces between like the *Periostrum*) as with a ligament. But the hinder part of every Ring-like Grille where it lies upon the Gullet, that it may serve better to the swallowing of meats, turns into a Membrane, which altogether is the same, and binding together those cartilaginous rings, and covering the whole hollownes of the *Larynx*, is always moist with an unctuous humour, by which it may as well be defended against the sucking in of sharper air, as breathing out more acrimonious vapours.

Membranes encompassing the wind-pipe.

Besides this inner Membrane, also another outward, though thinner, encompasses the whole Wind-pipe, by the aid whereof both the Cartilages are more firmly knit among themselves, and the whole Pipe bound to its neighbouring parts, and descends more safely and strongly into the Breast. Besides, we judge there are some other uses and offices of either Membrane, than that it only serve to fashion or defend the sides of the Wind-pipe: for as much as we do here manifestly observe many Nerves and nervous strings every where inserted, and also the more inward Coat of the *Astera Arteria* to be endued with Fibres, as well nervous as fleshy or musculous: from whence we may conclude the Wind-pipe to enjoy both a certain sense and motion either in the whole, or at least in some parts. And truly it is manifest even to common observation, that its more inward passage doth excel with a most acute sense; for as much as it is so much provoked by the smallest prejudice, that presently it is wonderfully forced into a convulsive motion, viz. a Cough: but as a sense of annoyance, and from thence very often an instinct of motion arises from this Vessel; so we think that its Fibres do after a sort move of themselves both in breathing and coughing. Surely in respect of this it is not to be doubted, because in this inner Membrane we find two orders of muscular Fibres in that fashion disposed as in the *Aorta* and Intestines: to wit, there is one upper order of straight Fibres, which while they are contracted, make all the circular Cartilages to be drawn together nearer to one another, and for that cause to abbreviate the Trunk of this Vessel according to all its parts successively. Under this lies another order of circular Fibres, which (while they are pufft up) being contracted, the hollownes of the Wind-pipe is much narrowed. Therefore when the moving Fibres of either kind make the passage to be straitned according to all its dimensions, it is obvious enough that they conduce to the discharge of the function of breathing, and more or less to be active, as there is endeavour to breathe quicker or slower, more intently or more remiss. These Fibres being more vehemently contracted in a Cough, in hawking, in blowing out, and certain other more strong exercises of expiration, do force the breath and other contents of the *Astera Arteria* to be violently expelled. Moreover from this action sometimes either depraved or hindred, it shall be declared hereafter how an Asthma, a Dyspnoea, and some other diseases about breathing do arise.

The glandulous and vasculous Coats.

This inner musculous Coat hath also two others, as if growing thereunto, to wit, one glandulous, and that full of vessels. For as in another place we have remarked about the Anatomy of the sanguiferous Artery, one may also here take notice, that the inward Pipe of the Wezand is covered with a most thick weaving of Vessels of every kind, and especially of those carrying blood, in fashion of a Net. The Arteries not springing from the Pneumonic Vessels, but from the Bronchial branch (which the most renowned Mr. *Ruysch* discovered to have its rise from the *Aorta*) are inserted into this same; which the veiny slips do accompany, owing their origine to the *Vena cava*. The nervous sprigs meeting these two, are variously folded; and so of all weaved together, is framed as it were a little Net, covering the whole back of the Wea-

Weazand, under which folding of Vessels very small and whitish Glandules are every where strewed, or rather cleave to them; just in the like manner, as we have in another place shewn to be in most other greater Vessels, and in all membranous Bowels: on all which the Lymphæducts adjoyned do wait. As to the use of these, without doubt the Arteries and Veins wash through the Pipe of the Weazand with bloody stream for its nourishment; and the Nerves carry plenty of Spirits, and the faculty of performing motions to the muscular Fibres. Afterwards whatsoever of superfluous moisture be left by the Arteries, that the Veins cannot bring back, the Glandules do receive and retain, until it may be sent back to the mass of blood through the Lymphæducts. When they are too much filled, by reason of the Lympha more plentifully left, a humour distilling from the Glandules as well as from the Arteries into the hollownes of the Wind-pipe brings a Catarrh. All the Coats of the *Aspera Arteria* distinct and separated from each other are expressed in the seventh Table.

The second part of the Wind-pipe, commonly called *Bronchos*, begins from the entrance of the Lungs: for near the fourth Vertebra of the Chest that great Pipe descending, is divided into two Trunks, one whereof goes towards the right side of the Lungs, the other the left: afterwards both having entred the Lungs, and being subdivided for the greater Lobes, distribute very many sprigs (as for the most part in the gills of fishes) to the Lobes or lesser Lobes through the whole frame of the Lungs. The passages of all these are furnished, even as in the Larynx, with Cartilages, but framed something in a differing manner: for in the *Bronchia* these are not Ring-like, but resembling a Coat of Mail, so that when there is need to contract those passages, the inferiour Cartilage goes under the hollownes of the upper, almost in the same manner as it is in the joynts of the shelly Coat of a Lobster. Provision is so made by the work of God, that when the Lungs are dilated, the *Bronchia* are stretcht out into the greatest length; and when they are contracted, the *Bronchia* are abbreviated, one part being drawn into another.

Of the *Bronchia*.

The Coats of the *Bronchia*, as also of the Larynx, have muscular Fibres of both kinds, together with the Glandules and the Net-like twisting of Vessels: from whence we may also conclude, that all the lesser Pipes of the *Aspera Arteria* have their constant turns of Systole and Diastole, viz. all the Pipes are contracted while we breathe out, and relaxed while we suck in air: moreover from the same Glandules and little Net of Vessels every where continued almost within every inward recess of the Lungs, doth distil the Catarrh humour. A certain Bronchial branch of the *Trachea* belonging to each Lobe of the Lungs is described in the second Table H. H.

Their Systole and Diastole.

And the branched *Bronchia* of both sides not only constitute two or more greater Lobes; but, as *Malpighius* hath observed, many lesser or little lobes distinct among themselves; for each Bronchial branch sends forth to and fro many little branches or twigs, every of which twigs being joyned with alike twigs of the Pneumonic Artery and Vein, from thence are parted into innumerable lesser sprigs; all which being every where fellowed and complicated among themselves, and having got Nerves and peculiar Lymphæducts, and ending in the outward superficies of the Lungs, represent as it were a certain private Grove; and so the whole structure of the Lungs consists of many little branches of the aforesaid Vessels complicated, as it were of so many several Groves. The branches whereof and outmost sides of which, although they may seem mutually to touch themselves and cleave together, yet they are disjoyned one from the other, and are every one bounded within their proper limits; far otherwise than the productions and communications of Vessels are in the Brain, where the Arteries and Veins rising up in its several corners, extend on every side, and creeping through its whole space, and mutually inosculating, do all communicate among themselves.

The Lobes of the *Bronchia*.

Their little branchings disjoyned from one the other.

That former fashioning of the Vessels hath been very necessary to the uses of the Lungs; for seeing the air ought only to enter the Lungs for that end, that it might pour out to the blood nitrous particles for its flame and vitality or life, and presently return back; and seeing the blood doth pass through the Lungs for that cause, that it might meet the air suckt in according to all its parts; therefore it behoves that both these, viz. the air and the blood be divided into small portions, and with these make every where distinct and short meetings. The manner of this is most elegantly perceived in the gills of fishes; for seeing the *Bronchia* are as

The use of the aforesaid frame.

so

so many greater Lobes, every one of these is divided into many rundles, furnished with a complication of every kind of Vessels, as if it were into so many Lobes; in every one of which the blood is drawn out by minute portions, as it were little rivulets, that it might thoroughly meet with the nitrous particles, and afterwards return into its chanel.

The uses of the
little bladdery
Cells.

The Bronchial Pipes lead into the utter cavities, viz. into the numerous little Bladders discovered by *Malpighius*; which truly are certain continued parts of the *Aspera Arteria*, but distinct from the former, because the Grilles are wholly wanting to them, and, which supply the turn of these, are distant one from another in larger spaces: for all the Bronchial branches send forth lesser slips from themselves every way; whose passages, although void of Grilles, notwithstanding are straitned as it were with certain ligaments at certain intervals; and the spaces between these being filled with air sucked in do make partly those small bladdery little Cells. In truth those passages may not unaptly be compared to the Gut Colon of a Mouse, whose continued hollowness in as much as it is girt about in divers places, seems to be divided as it were into many little purses. Moreover those bladdery passages being shorter on either side the *Sinus* or hollowness, have as it were particular little Bladders growing thick to them, and therefore the heap of all the Cells seems not much unlike to a bunch of Grapes. The Figures of these as much as may be are exactly represented in the third Table. Those little bladdery Cells, that they may put forth their contracting endeavours for breathing, have muscular Fibres, as is plainly seen by the Microscope. For as much as great plenty of air ought to be drawn within the Lungs, and reserved in part, lest it fail at any time; therefore besides those upper passages which are as it were the threshold and dens, moreover more inner chambers and capacious are required, in which the air may be treasured up, and from thence be dispensed upon occasion. For it sometimes happens the external is too sharp, or otherwise disagreeable to the Lungs; so that as it was greatly necessary that it should be sucked in more sparingly, and its vehemence presently be tempered and rebated by the air treasured within. Moreover it cannot be drawn in or inspired otherwhile in quantity great enough, as in running, singing, or much speaking, also in some crazy dispositions; and in that case the inward air being rarified, supplies in a manner the defect of the outward.

Endued only
with muscular
Fibres.

Therefore seeing those bladdery little Cells receive a greater flock of air than that they can be bound presently to return it all by every turn of expiration; therefore the grisly twigs are wanting to them, and their hollownesses are more large of themselves, that they may be more largely distended: but that they may puff out a greater quantity of air upon occasion, or throw out matter to be coughed out, being endued with muscular Fibres, they contract themselves more narrowly, and throw out what is contained within them thoroughly. For the ordinary Systole's of the Breast, which the relaxation of the Muscles do partly effect, cast out perhaps at every turn the whole air from the *Trachea* and *Bronchus*, but not from the little Bladders: for the emptying of these as often as need shall be, both the cavity of the whole Breast is very much straitned, and the small bladdery Cells themselves are straitned from their proper Fibres being drawn together.

The description
and use of the
Pneumonic Ar-
tery.

2. The next Vessel is the Pneumonic Artery, of whose most thick branches extended every where to and fro, and with other branches twisted and complicated together, the frame of the Lungs consists. This Artery issuing from the right *Sinus* of the Heart, and inclining towards the *Trachea*, is parted into a right and left branch; which applying themselves to the like parallel branches of the *Trachea*, do accompany them every where, or rather are set under them; for they are planted beneath, and are first carried into the greater lobes of the Lungs, and afterwards into all the lesser lobes: in every of which the little branch of the Artery stretched out, sends out on either side more slips from it self, which presently are associated by other bronchial and venal slips, and are several ways complicated; and where the outmost sprigs of the *Aspera Arteria* depart into circular little Cells, the Arteries being complicated with the Veins (as is discovered by the Microscope) do girt about those little Bladders with their thick branching, and enwrap them like Ivy: from whence we may conjecture, that it is not for nothing that the Blood-vessels that are any where in the Lungs, do curiously wait upon those of the air, and every where insinuate and intimately mingle themselves. Surely whatsoever hath been supposed by others, I shall not easily believe that this is done for the more exact mingling

mingling of the Blood and its parts, be they never so unlike. For to do that, what need would there be of so full an access of air, which in rightly making other mixtures (the more perfect whereof are called Digestions) we seek as much as we can to keep out? For if the air might freely come and go, the Particles that should be mixed, would most of them fly away. And as to that which is affirmed, That the Blood in the Lungs is carried through those small, winding and extreme narrow passages only that it may be the better mixed; I say, that its being so carried is quite contrary to such an intention: for the best mixture of any liquor (as also of the Blood it self) is made by fermentation; and the liquor to be so mixed or fermented, like Wine in a Hoghead, requires a free and spacious room: but its going through these small and narrow passages like so many strainers, serves rather for the separation than the mixture of its parts; wherefore unless the Blood be exactly mixed in the greater Vessels, and be there rightly fermented, it does, while it passes through the Lungs, leave there the dregs and whatsoever parts are not rightly mixt, and so does stuff up and very much obstruct their passages; as we may see in persons affected with the Green-sickness, Cachexy, and that sort of Dropsie called *Leucophlegmatia*, who all have a difficulty of breathing, by reason of dregs of the ill-mixt Blood that are left there. Wherefore the use of the Lungs seems to be this, That the Blood through the lesser Vessels, as so many rivulets, may as to all its parts lie open to and meet with the nitrous Particles of the Air, and be by them enlivened and accended. The Pneumonic Artery, as also the *Aorta* and Wind pipe, hath a muscular Coat furnished with two ranks of Fibres, namely straight and circular; which doubtless, when they are contracted, do make the Pneumonic Arteries to beat, and the Blood to be urged and driven still more and more forward. A great many Glandules with a Net of Vessels lie on this musculous Coat. The frame and branching of the Pneumonic Artery in some one Lobe of the Lungs are expressed in the second Table. All the Coats of this Vessel are drawn distinct and apart from one another in the sixth Table and first Figure, and also in the fourth Table and second Figure.

The Pneumonic Vein, having its rise in the left Ventricle of the Heart, and being divided and variously subdivided first into greater branches, and then, according to the greater and lesser Lobes of the Lungs, into lesser, and lastly into the least of all, is carried above the Weazand, and as it goes on does exactly answer to the branching both of the Pneumonic Artery and the Weazand, and goes every where with them as it were cheek by joll; and where the Weazand ends into the little Bladders, the Veins being twisted with the Arteries (as was said before) do make as it were a little Net wherein those little Bladders are encompassed. The Anatome of the Pneumonic Vein differs little or nothing from that of the *Vena cava* and its branches. All the Vessels of this kind have four Coats distinct from one another.

The description
and use of the
Pneumonic
Vein.

1. The outmost of these Coats consists of Fibres that seem to be nervous, which perhaps are after a sort muscular and are extended straight long-wise, (though in no very regular order.) This Coat of the pulmonary Vein is very laxe, and loose from the rest of the Vessel, insomuch that it may all of it be blown up and very much extended, as if it were a distinct Vessel: Whence one might suspect that this were a peculiar passage to carry back *Lympha* or *Serum* separated from the Blood: but it seems to be more probable, that this outmost Coat is therefore made so loose, that the passages might be much distended and widened for the return of the Blood now hot and boiling.

2. 3. Two other Coats (common both to a Vein and Artery) viz. the vasculous, and the glandulous lie under this: the office of the vasculous is to bring nourishment to the part, and of the glandulous to receive and send away the superfluous serosities.

The use of the
venous and vas-
culous Coat.

4. The fourth and inmost Coat is plainly muscular, having Ring fibres, as the like Coat of an Artery hath, which certainly being successively contracted after the stream of Blood, do cause its return to be hastened, and on occasion to be shortned. But here arises a doubt, wherefore, seeing the Veins as well as Arteries have contracting muscular Fibres (which in the latter are pulsfick) and seeing both are alike joined to the Heart that beats continually, the Veins as well as the Arteries should not stately beat according to the constant turns of the Systole's and Diastole's in the Heart? It may easily be answered to this, first, that the Arteries have a great deal more of the moving Fibres than the Veins have; and therefore whereas those being

The muscular
Coat.

why there is no
Pulse in the
Veins.

being strongly contracted successively, do force the Blood along as if driven with a wedge, for *these* it sufficeth that whilst they are gently contracted behind the stream of Blood, they calmly and equally drive it forward, flowing back again of its own accord, and as it were down-hill. But *besides*, the reason hereof seems to depend somewhat on the unlike or rather inverted conformation of the Vessels; for the Blood conveyed by the Arteries is driven still from wider to narrower spaces, and therefore going along it every where violently distends them, and lifting up the sides of the Vessels raises the Pulse; because whiles that part of the Artery that is behind the Blood is contracted by its muscular Fibres, that part which is before it, must needs beat being filled with the stream of blood gushing in: but on the contrary, the blood in the Veins returning to the Heart, runs out of less into greater spaces, or out of rivulets into a more capacious and deep chanel, and therefore glides along silently and without the fluctuating of a Pulse.

*The disposition
of the blood in
the Pneumonic
Veins.*

The blood in the pulmonary Veins seems as much, or more than that within the Arteries to be animated or inflamed anew by the air insinuating it self every where from the Pipes or little Bladders of the *Trachea*, because in those Veins, 'tis first changed from a black-purple to a scarlet: the reason whereof is, because the blood at the extremities of the Vessels, namely as it passes out of the Arteries into the Veins, does every where and most of all meet with the particles of the air. And for that reason it is, that if any liquor be squirted into the Pneumonic Artery, it will not so readily and quickly pass through the Lungs and return by the Vein, as it will do if you make the same experiment in any member, or part of the body besides; yea part of the liquor so injected will sweat through into the Pipes of the *Trachea*, or the spaces between the little Lobes, and another part, being turned into a froth, will return very slowly by the Veins: which is a certain proof, that while it passes through the Lungs it makes a stay in the mouths of the Vessels, and is mingled with the airy particles. The Circulation of the blood through the Lungs hath something diverse from, or rather contrary to that which is made through the rest of the body; seeing the Pneumonic Arteries contain a black-purple blood, and the Veins a scarlet, whereas in all the body besides the branches of the *Aorta* carry a scarlet blood, and those of the *Vena cava* a black-purple. Besides we may observe of the pulmonary Vein, that it does every where in its whole length want valves, except where 'tis fastned to the Heart. Which appears by this, that when any liquor is injected into its trunk (just as it is in the Artery) it presently passes through all its branches without lett. Which ought to be so, to this end, that the blood may always, because of the violence of the passions, freely every way fluctuate and regurgitate in and about the Heart. Besides, that the left Ventricle of the Heart might never be overcharged with the blood impetuously rushing into it, by the instinct of Nature the Fibres at the root of the Vein being contracted, its course might be inverted and flow back. The description of the Pneumonic Vein as to its utmost branching is in the fourth Table and third Figure.

*The Lymphæ-
ducts added to
the aforesaid
Vessels.*

To these three sorts of Vessels, wherein the air and the blood are conveyed, the Lymphæducts that carry forth a water are joined. A power of these dispersed through the Lungs, wait on the Arteries and Veins. All the branches tending from the surface of the Lung towards its original, unite into some greater trunks; which, being inserted into the Wind-pipe, discharge therein the Lympha that is superfluous from the blood and nervous humour. Indeed there is need of a great many of this sort of Vessels in the Lungs; because, seeing the blood is hottest of all here, is hastily circulated, and yet can exhale nothing to without by transpiration, the Veins can hardly receive all the whole mass of blood from the Arteries; and the Glands contain not long what is deposited in them: therefore there as need of Lymphæducts as so many chanel, whereby the superfluous humour might continually be sent off. If these at any time happen to be obstructed or broken, there often follows a Dropic of the Lungs or Breast, and sometimes Coughs and Phthisicks. These lymphatick Vessels of the Lungs may very well be seen, if in dissecting a live Dog you press the top of the Thoracick duct, that nothing may be poured into the subclavian Vein: for then the Lymphæducts of the Lungs, because they cannot discharge themselves into the common Receptacle now stopt and filled, swell much and are very apparent. If such a stoppage be made for some time in a Dog that hath eat and drunk largely, a milky liquor will sweat into the Lungs out of the Thoracick duct, the Valves being unlocked: yea and the same liquor will pass through the Lymphæducts

ducts placed far beneath the Reins, and will render them strutted with that humour, as if abounding with milk. The rough delineation of the Lymphæducts spreading themselves in the superficies of the lobe of a Lung, is represented in the first Table.

5. The last kind of Vessels belonging to the Lungs are the Nerves and their branches, whereof there are many (as we elsewhere intimated) dispersed every where through the Lungs. Heretofore doubting about the office of these, we were induced to think the first force, or at least instinct of breathing depended on these Nerves; because otherwise we can hardly conceive, after what manner the motion of the Lungs in breathing, coughing, laughing, and other their actions should be always so exactly proportioned according to the several exigences of Nature. For even as the blood doth more intently or remissly heat and boil up within the *Præcordia*, and as certain contents of the *Trachea* provoke the nervous Fibres, we breathe either quicker or slower, and oft-times, though unwillingly, we cough. But besides there doth occur another and more necessary use of these Nerves: for since it is manifest, that the Coats of those Veins and of the *Trachea* are every where endued with muscular or moving Fibres by which they are contracted, it is plain, that the Pneumonic Nerves do convey as well plenty of spirits, as inclinations of contraction to those Fibres. And it is very probable from those Nerves convulsively distempered, that the Palpitation of the Heart is often excited, as also the Asthma and Chin cough. We have some time since delivered the Anatomy or description of the Pneumonic Nerves in our Treatise of Nerves, viz. pag. 311. so that there is here no need to repeat or enlarge. The fivefold Vessels forementioned being mutual, and many ways accompanied in their distribution, as if divided into secret Groves with small bladders as in Trenches every where interwoven, when they are complicated and variously woven together do constitute a fleshy web, which is the very structure of the Lungs: which moreover appears like a more solid *Parenchyma*, in as much the Arteries and Veins being filled with blood are stufft up, and the Vessels of the *Trachea* and Lymphæducts being emptied of the air as well as water, do fall together and seem to close. We shall the less admire the fleshy fabrick of this Lung wove together out of meer Vessels and little Bladders, if we consider the frame of the seminal Testicles to be nothing else than a heap composed of hollow filaments or spermatie Pipes woven together. The description of the Nerves of the Lung, and what relates to the bundle of Fibres whereof it is compact, and to the spreading of its branches, are described in the fifth Table.

*The nervous slips
dispersed
throughout the
Lungs.*

The web of the Lung, as above-said, being weaved together of Vessels and little Bladders, and divided according to their greater and lesser branchings into lobes and little lobes, a Membrane wraps them about as a common covering. Of this there are two Coats, viz. one outer and fine, which appears like a certain subtle texture or weaving together of nervous filaments (as is apparent in most other Bowels;) the other more inward, which is both rough and somewhat thick, and consisting almost of meer ends of Vessels and little Bladders: and by reason of the hollownesses every where caused from these, its inward superficies resembles a Hive of Bees; the forms of these are aptly enough described in the eighth Table. This Membrane of two Coats blown up hath very many and large Pores, insomuch that if Quick-silver be poured into the Tracheal branch of one of the lesser lobes, almost filling within the whole Membrane, it will every where burst out from the Pores. Both the arterial blood and the air beating in this Membrane as against a bank, are reflected; the former is brought back by the Veins into the left Venter of the Heart, a certain watry part being sent away through the Lymphæducts. In the mean while the air is returned back by the same passages of the *Trachea* by which it flowed in. For continually fresh air ought to be sucked in, that it might supply nitrous Particles to the Blood; to make room for which the other old air being now weak and useless, must be first breathed out. Because therefore both functions are to be performed within the same passages, it is to be done by alternate turns, first the one, then the other. While the air is drawn in, the Lungs are blown up, as if wind were forced into them; and whilst the same is breathed out they fall down, and are narrowly squeezed together for the benefit of excluding it; and so after the manner of Bellows discharge constant changes of the Systole and Diastole. Yet by what impulse and Organs it is accomplished, is worth our labour here to consider.

*The Coats of the
lungs, whereof
one is smooth,
and the other
rough.*

Therefore upon the whole matter it is manifest by common observation, the Diastole of the Lungs perpetually succeeds the opening the Breast, and its Systole in like manner its contraction; so that we may conclude, when the cavity of the *Thorax* be-

*The Systole and
Diastole of a
Lung.*

ing dilated a greater space is yielded to the expansion of the lungs, the extern air of its own accord leaps into the *Trachea*, whether by reason of the Pulse, or by its own Elastic force (for it is all one) and presently enters into its Trunk, the *bronchia* and all the little bladders, and blows them up; namely for that end, that its nitrous particles may every where occur to the blood, washing all parts of the lungs: afterwards when the breast receding from that dilatation, is straitened as to its cavity, even the lung being compress'd, falls together by its Diastole, and excludes the air even now breath'd in. But truly, because the air doth not of its own accord leap out with that plenty as it skipt in, neither the hollowness of the breast so frailty contracted, that it should mightily compress the lungs; therefore all the passages of the *Trachea* are endowed with muscular fibres, which being contracted orderly while we breathe out, they may promote the expulsion of air. Wherefore, that the cause of breathing, and the manner of doing it may more plainly be made known, inquisition ought to be made after what manner, and by what Organs, that interchangeable dilatation and contraction of the breast are performed.

Its motion mechanically unfolded.

We cannot enough admire, concerning these motions, the cunning artifice of the Divine Creator, evidently adapted unto Mathematical rules; for truly in no other matter doth He more plainly appear *ὁ θεὸς γεωμετρεῖ*. For when both the enlarging and the straitening of the breast ought to be performed by some muscles (to whose function it only belongs to contract;) the matter is so ordain'd, that the ribs which shape out the sides of the *Thorax* even as of oblong parallel lines bowed towards a Cylinder, are brought one while in a square figure with right angles for the enlargement of the breast, and afterwards into the form of a Diamond-figure with sides unequal, with acute angles for the contraction thereof. What follows from the situation of parts so chang'd, that whenas the sides depart farthest from one another, the ends are brought nearer, and so *ἐκτὸς*; and for that cause the largeness of the space is wont rather to be altered than either augmented or diminished; lest it may so happen about the cavity of the *Thorax*, it is so provided against by an admirable workmanship, that whilst the ribs ascend upward for enlarging the breast to a square figure, lest the ends should be shortned inward, the *Diaphragma*, which closes the bottom, swells downward toward the Abdomen; so that the *Thorax* may be enlarged as well towards its length as to its depth: on the contrary, while the ribs beneath are brought to straiten the breast towards the figure *Rhomboides*, lest they should depart farther than they ought, the *Diaphragma* ascends upwards for that cause that the largeness of the *Thorax* may be straitened, while we breathe out, according to both dimensions.

The Muscles serving respiration.

What belongs to the muscles of the breast, serving as well to the enlargement for sucking breath, as to the constriction for breathing out, the most wise Creator of Nature hath ordained more and sundry instruments of either function; Therefore truly that the work of breathing being especially necessary as to life might be performed incessantly and very strongly, some of the former order of Muscles, *viz.* those by which the hollowness of the *Thorax* is opened, do raise the ribs and afterwards draw them back, even as they are bow'd and more enlarg'd; in which number there are three muscles to the shoulder, one belonging to the loyns, and eleven intercostal outward; and another inward muscle, *viz.* the *Diaphragma*, depresses the bottom of the breast, and enlarges its length and depth.

Their function as well in inspiration;

The aforesaid muscles, *viz.* the scapular, lumbar, and intercostals being also appointed with the *Diaphragma* for the function of breathing, are accurately enough describ'd by many Anatomists, but chiefly by *Fallopins*, that here seems little need to unweave this web; especially because a more full and permanent knowledge of these parts is not wont to be acquired unless by frequent dissections and anatomical inspection. The four former muscles being of divers forms, conduce chiefly to stronger and violent inspiration; but the exterior intercostals in regard of the ordinary actions of breathing employ their continual endeavours by turns during life, every one of these being uniform, with a fleshy and more thick basis, being rooted in the bottom of the upper rib are carried by oblique fibres, and broad towards the forepart unto the top of the rib that lyes under, and are implanted to it with a small and tendinous end; whence it follows, those fibres being swell'd, and shortened towards their root, do lead and draw back the nether rib towards the upper; and so while all these muscles are contracted together, all the ribs are raised upwards, and altered from oblique angles into direct ones, they render the trunk of the *Thorax* more large, but something

thing shorter; which defect that it may be helped, the Diaphragma (which being free before from the Systole, is hidden within the cavity of the breast) together with the ribs drawn upwards, is extended beneath; so that the breast, as it were a Drum braced, does become most capacious; and in the mean time the lungs, having a more ample space yielded to them, are blown up by the air rushing in wheresoever there is passage, and fill the whole hollowness of the *Thorax* enlarged.

Thus far touching the muscles serving to inspiration, which ever and anon ceasing from contraction, the ribs presently fall down from a direct position into an oblique; and the Diaphragma also being freed from its extension, ascends into the cavity of the breast, or is rather thrust thither by the bowels of the Abdomen; and so by reason of the position of parts so changed, viz. the breast straitened, and the lungs compressed, the act of expiration doth succeed. Some have determin'd this to be a meer intermission of the other, and onely to proceed from the rest, or ceasing of the muscular motion (by which breathing is performed.) But the declination of the ribs from right angles into oblique, and the ascension of the Diaphragma, is related to be the natural position of these parts, because they are found in such a situation in dead bodies. I think my assent not easily owing to this opinion, because sometimes the function of expiration is performed much stronger and more violently than that of inspiration, as in coughing, singing, laughing, hollowing, and in other affects whose exercises are the more difficult labour and more earnest endeavours of the breast: Wherefore there is no reason that we should think that such vigorous exercises of expiration, should be excited by the meer rest and ceasing of the aforesaid muscles, but from the motion of others opposed to them. Moreover the Muscles now cited and opposite, and straitning the breast, seem to be required not only by reason of their violent expiration, but for their ordinary and constant service; at least for the poising the function of respiration: for otherwise those other whose office it is to enlarge the cavity of the *Thorax*, being sometimes unmindfull of their task, do it either stronger or longer than is convenient; wherefore it is necessary they be forthwith admonished by others, viz. their Antagonists subservient to Expiration, and to be restrained in their duty. But the muscles appointed for the straitning the breast, are the *Sacrolumbus*, the Triangular, and inward Intercostals, and some muscles of the Abdomen; the use and descriptions of all which are delivered by many Anatomists, and most accurately by *Fallopins*. The inner intercostal muscles as they obtain a contrary situation, so a contrary function to the outer intercostals, which namely is to depress the ribs, and to straiten the cavity of the breast, by forcing it into the *Rhomboidal* Figure. For we are to observe, that the carneous and thicker basis of each of these is implanted in the lowest part of the nether ribs, and the moving fibres, ascending from thence obliquely and forward, and dividing cross-wise the rest of the outward intercostals, with their smaller and Tendony end are engrafted in the bottom of the upper-rib; hence none need doubt, but that these inner muscles do depress all the ribs, or bring them downward: but whilst these ribs are so depress'd, that the trunk of the breast is rendred more strait, these inward muscles (otherwise than the outer) do not only incline the ribs downward, but also their gristly or cartilaginous processes. For *Fallopins* hath acutely described this: *That the outward intercostal muscles do onely fill up the inter-spaces of the ribs and not of the gristles, but the inward fill up both spaces.* The reason whereof seems to be after this manner, affording a most delightfull speculation of the *Divine Architect*, viz. while the ribs are brought upwards to the exercise of fetching in breath, and are withall drawn back towards the Spine, that motion commencing backward, is performed by the ribs themselves; which being first moved together, the cartilages easily discharge their function as cords fitted to that purpose: wherefore there seems little need of the muscular aid to place these in their order; but to put the ribs in action, not onely the intercostal muscles afore mentioned, but the four other greater ones do continually endeavour it; but on the contrary, that the ribs may be depress'd and brought forwards together, the force taking its rise before, is performed by the cartilages as so many leading cords, most easily bending the ribs downwards as far as need requires.

Moreover to this end, that the cartilaginous appendices of the ribs may be drawn down and nearer one the other for the exercise of expiration, not onely the inward intercostal muscles fill as well the intervals of the cartilages as of the ribs, but moreover an entire triangular muscle is allotted for this function; for this springing beneath from the bone of the Sternon, and ascending upwards obliquely, is inserted in-

Wherefore the triangular Muscle being small in a man, is stretched out through the whole bone of the breast in a Dog.

The Diaphragma follows the motion of the Abdomen.

The Labour of Muscles the same in expiration as in inspiration.

The causes of the above-mentioned motions.

In the animal function.

And natural.

to the lower Cartilages, which it constrains towards its head, and bends the *Thorax* nearer on the other side. That is worthy of consideration, which *Fallopins* hath remarked touching this muscle, viz. whereas it is so little and minute in a man, that it may hardly be allowed for a Muscle, it is stretched out in a Dog along the whole bone of the Breast, and reaches to all the Cartilages, even those inosculated into the Sternum of the true Ribs. The reason of which difference clearly points at the Divine Providence touching the Fabrick of Animals. For whereas this Animal is born to most swift and long running, that the blood, while it is more vehemently agitated, may duly be kindled and fan'd, as it ought swiftly and strongly to draw in the air, even so to expire it; (for that fresh air may be more freely sucked in, it behoves that all the old be strongly cast out and exploded) therefore for the stronger discharge of this exercise (of the which little use in a man) this Muscle of a Dog is allotted a great bulk, proportionable to such a work.

Hitherto of the Muscles that straiten the Trunk of the Breast: by whose provision it is manifest enough, that the relaxation of the opposite muscles are not sufficient to this function. But that while the breast is constrained, the Diaphragma ascending upwards may shorten its hollowness, it is not enough that it is released from its contraction, but it is also necessary, that as soon as this ceases, the muscles of the Abdomen being contracted squeeze together the Bowels, and press them upwards, by which the Diaphragma being relaxed, is lifted up and driven higher into the Trunk of the *Thorax*.

From the supposed reasons of these things we may infer, no less endeavours of the muscles are employed in the exercise of expiration, than in inspiration: nay rather we may affirm them greater, after this is added, that the Pipes of the *Trachea* and *Bronchii* are endowed with muscular Fibres (as we have shewed) which being only contracted while we expire, do cause the air contained within to be cast out with the greater force. And truly so it ought to come to pass, because the air prevailing with an elastic force, doth of its own accord readily enter the pulmonary passages, as often as they are suffered to be open; but from thence that again it may presently and thorowly be excluded, there needs a certain force and compression of the parts to thrust out. For although the inspiration precede in course, yet it is necessary that expiration follow immediately after, and be proportioned according to the fashion thereof; for that it may be great, the turns or changes of this being greater are requisite. Wherefore in vehement exercise of the whole body or of the Lungs alone, that the fresh air may more plentifully be drawn in, all the old air must be moved, not only out of the *Trachea* and *Bronchii*, but also out of the farthest little Bladders every turn or change of breathing out, and expulsed most of it: whereas while we draw in the breath only the muscles of the Breast are employed, the Lungs having respite, in strong breathing out both the opposite Muscles and the Lungs themselves labour.

Having thus explained the Organs of Breathing, it remains yet to be inquired into, by what instinct, being stirred up to motion, they so repeat perpetual changes of Systole and Diastole, that one while these muscles are contracted for inspiration, and another while for expiration, in the mean while the opposite muscles have a pause, and are moved by turns, that they mutually give place to themselves successively. From all this in the first place it is clear (which likewise in another place we have abundantly declared) that the animal Spirits, for the exercising the contractive motion of the muscles, leap from the Tendons into the fleshy Fibres, and afterwards for their relaxation they recede out of these into those. Moreover, whereas the mutual function is twofold, viz. spontaneous and merely natural, we have before shewed in the former, that the Spirits are brought from the Tendons into the fleshy Fibres by approaches according to the command of appetite, and to remain within during the action, till they are dismissed by its will; and afterwards return into the Tendons, till they are again commanded forth; inasmuch that the times of their motion and rest are unequal and uncertain, and variously determined at our pleasure.

But it is far otherwise in the natural function: because the animal Spirits are carried out from the Tendons into the flesh by perpetual turns, or constant reciprocation, and a short contraction being made, presently leap back from the flesh into the Tendons, and so alternately: after which manner the Heart it self, the Organs of the *Trachea* and breathing, also the fleshy Fibres of the Stomach and Guts, unless they are otherwise limited by reason of their objects, are drove on by their constant Systole and Diastole.

It will be needless to repeat here what we have already observed in another place touching these two kinds of motions, viz. that the animal spirits of the spontaneous moving function are altogether or chiefly dispensed from the brain, and the others causers of the merely natural function are dispensed from the *Cerebellum*; moreover also as the plenty of both sorts of spirits, so the very instincts of beginning those actions have their conveyance through the Nerves.

The motion of the former sort ariseth from the brain, the other from the Cerebellum.

Notwithstanding here ariseth a doubt, to what kind of moving function, viz. whether spontaneous, or merely natural, the actions of breathing ought to be referred; also of what original, viz. whether of the Brain or *Cerebellum*, the animal spirits appointed to that employment, are. It is manifest enough that this function is in a sort partaker of a spontaneous motion, because it is in our power one while to shorten its exercises, at other times to prolong, and otherwise diversly to alter them, yea sometimes a little to restrain them. Moreover the nerves belonging to its chief moving Organs, viz. the Diaphragma and Muscles of the breast, springing from the nerves of the Arms and Loyns, do owe their descent to the Brain, and do plainly acknowledge the spirits they contain are chiefly ordained for voluntary motions: but moreover on the contrary, this function is so far natural, that its organs do reciprocate the constant changes of Systole and Diastole in sleep, without our notice, and while we wake, we not perceiving it: Moreover although we can for some little time stop its exercise, or at our pleasure vary it, yet we deny it to be altogether or long suspended: besides, although the nerves appointed to the muscles of the breast and Diaphragma proceed from the spinal nerves, yet these latter coming from the branches belonging to the arm communicate in their progress with the slips of the intercostal nerves; moreover, all the other nerves (which belong to the *Cerebellum*) arise from these, which are spread about through the *Trachea* and Lungs.

It is a quære of what kind the actions of breathing are.

From these it plainly follows, that the power of breathing is as it were a mixt action, and doth participate of either moving function, viz. as well of the spontaneous as natural; and that the spirits and nerves of either Province are employed in this duty, which proceed as well from the brain as from the *Cerebellum*; and truly so it ought to come to pass according to the animal government: for although some actions of breathing necessary for the preserving life, ought to be constant and perpetual, there are yet many other motions of the breast and lungs onely occasional, and to be perform'd at our pleasure, as may be discerned in laughing, crying, singing, hollowing, whistling, and other singular offices of the lungs and wind-pipe; in which works that they may be done strongly, the muscles conspire together, and endeavour jointly. As in violent labours and exercises of the whole body, by which the blood being stirred up doth want the greater ventilation, the arms being vehemently moved also do force the muscles of the breast, and other pneumonic organs, into more speedy motions for a more frequent breathing. And truly for joint labour of this sort of the Arms and Diaphragma, the nerves serving this motion proceed from the nervous branches of them. Moreover, it is provided for this purpose, lest the exercises of the body might enfeeble at any time the strength of the lungs, or exceed the order of breathing; for when its organs labour more difficultly, or begin to be weary, the nerves of the Diaphragma do warn the other nerves of the arms, plucking them and as it were admonishing of their duty to desist from an over intense motion.

It is concluded to be a mixt act.

For whereas the function of breathing is ordained for many uses, whereof some are merely natural, and others spontaneous or violent; therefore the spirits and the nerves which proceed and have their government as well from the brain as from the *Cerebellum*, ought to be joyned together, and to afford their social endeavours; yet on that condition, and as it were by mutual agreement, that one give place to the other by turns for the discharging all works chiefly necessary, or convenient, and do mutually obey. From the pneumonic nerves, the instinct of ordinary breathing or merely vital beginneth, and is presently communicated to the nerves of the Diaphragma, and from thence to all of the *Thorax*; so that presently all the moving parts agree together in the action, and cause the Systole and Diastole of the breast in such sort as are required to the present state of the blood; notwithstanding on the contrary, as to other actions of breathing, whether spontaneous or violent, it seems to have them also, viz. the instinct or first force of these, beginning one while from these muscles, another while from them is presently communicated to all the other Organs; so that it is called upon by a working consort of all together sooner than the twinkling of the eye, for the performing the designed acts of breathing.

The nerves of the lungs some rulers of the natural motion, and others of the voluntary.

Both do alternately obey one the other, and agree in their office.

What

What we have hitherto declared about the Organs of Breathing and their functions and uses, that they may more clearly be manifest, it seems to be material to expose to your view the forms of some of their chiefest parts described to the life, together with the explication of their Figures: yet it seems proper first to insert a few things concerning the Lymphæducts and interspaces of the Lobes omitted in the former Discourse.

The interspaces of the little Lobes have passage one into the other, and from thence into the Lymphæducts.

The most renowned *Malpighius* first discovered these little Lobes of the Lungs and their interspaces; but to what uses they serve he hath not clearly enough shewed. Happily it may seem that these little places and empty spaces within the Lungs, are certain receptacles of the air (that there may be a larger store of it.) Notwithstanding it is evidently manifest upon experiment frequently made, that the air pufft into the Pipe of the *Trachea* (which is the only entrance into the Lung) doth not enter or blow up these interspaces of the little Lobes: notwithstanding if you blow into the hole of any of these interspaces, immediately all these spaces pufft up do swell in the whole lobe of the Lungs, so that all the little lobes distinct by great interspaces, will appear with a pleasant prospect; as is expressed in the second Figure of the third Table. Moreover the Lymphæducts creeping through the superficies of the Lungs, seem to be every where included in little Membranes covering those interspaces, and to end in them. But as the lymphatic Vessels are all furnished with little valves, so those which appertain to the Lungs are furnished with almost infinite; as is to be seen in the warm large lobe of an Ox, and expressed to the life in Tab. 1. d, d, d, d.

Which therefore is done, that the vaporous steaming of the blood being received by the interspaces, and condensed into water in the Lymphæducts, may be conveyed out.

That I may dare to conjecture concerning the use of these things, it is probable, that those cavities intercepting each little lobe, do receive the vapors flowing copiously every where from the blood being kindled, (when they cannot any where else be better thrust down or separated) which sweat through their slender Coats into these cavities out of the ends of those Vessels, and thence being forced further, they are condensed into water to be carried out of the Lungs through those appropriate Vessels: moreover lest the Lymphæducts caused from vapors within those passages, and so being made thick, should whirl again back into the Lungs (which would bring great prejudice to them) the thickest obstacles of the valves do hinder. For I have frequently admired what becomes of the vaporous steams which incessantly flow in great plenty, and sometimes most impetuously out of the blood burning ardently in the *Præcordia*. For although very many of them fly away through the passages of the *Trachea* together with the air while we breathe, notwithstanding one only way of passage or particular sluice doth not suffice to them, from every place breaking forth: wherefore these little places or empty spaces are every where placed, that they may receive those vapors shut up in the Lungs, and may drop out the same immediately condensed through the Lymphæducts, as if through so many noses of an Alembick.

The progress and distribution of the pulmonary Lymphæducts.

The lymphic Vessels having their passage out of the Lungs incline towards the passages of the *Thorax* with their numerous branches, and are for the most part mingled with them; but they climb upon the *Oesophagus* in their way, as also the trunks of the *Trachea* and the *Aorta*, and do lose many slips in them by a various infertion; likely for this cause, that some of the lymphatic humor may be bestowed for making slippery the sides of those Vessels.

The Explication of the Figures.

THE first Table shews one entire lobe of the Lungs, upon whose superficies the Lymphæducts are seen spread through every where.

A. The Orifice of the *Trachea* being cut lying in the midst of the Vessels.

B. The Orifice of the *Pneumonic Artery* lying under.

C. The Orifice of the *Pneumonic Vein* placed above it.

d, d, d, d. The outer Lymphæducts spread abroad through the superficies of the Lobe.

e, e, e, e. More Lymphæducts meeting on the back of this Lobe, from whence they pass into the *Thoracick ducts*.

The second Table shews one lobe of a Sheeps Lung cut in the midst, that the upper part (wherein is the trunk of the Vein) being removed, and the trunk of the *Aspera Arteria*

Arteria laid by it self, the branching of the Pneumonic Artery is shewn throughout its whole frame, viz. through the small and least little Lobes. All the passages of this, viz. the slips and twigs how small soever, being filled and coloured by any liquid thing cast into them, are drawn to the life.

- A, A, A, A. The nether half of the Lobe divided, containing the branching of the Pneumonic Artery.
- B, B, B. The Trunk of the Pneumonic Artery belonging to this Lobe.
- C. A hole from whence its ether branch was cut off and removed.
- D, D, D, D. The Trunks from which its other branches (because they could not be expressed in this Table) were cut off.
- E, E, E, E. The arterious stems thereof stretcht forward into length, the side-branches on both parts stretcht out into the right and left side.
- F, F, F, F. The twigs and lesser slips, which are every where intermingled with the like from the Veins and Bronchials; and at last woven together with the Veins every where encompass the orbicular little Bladders, and bind them as it were in clusters.
- G, G, G, G. The Bronchial branches, which being cut from the stem of the Trachea laid aside, and entering secretly into this lobe of the Lungs, are accompanied with branches that bear blood.
- H, H. The stem of the Trachea appertaining to this Lobe, which lay upon the Pneumonic Artery, cut and laid aside.
- f, f, f, f. The stems of the Bronchial branches, which are immersed partly in this portion of Lobe described G, G, G, G, and are partly distributed in the other half cut off.

The first Figure of the third Table expresses one lobe of the Lungs, according to the branchings of the *Aspera Arteria* divided into lesser and less lobes, the twigs and slips of which Vessel being filled by a liquid first injected, and afterwards separated from among themselves towards the little lobes, are also drawn to the life.

- A. The Trunk of the *Aspera Arteria* being cut from the rest of his body.
- B, B, B. The inner part being cut open, that as well the holes leading into all its branches, as its straight muscular Fibres, are viewed together.
- a, a, a. The above-mentioned holes leading into the every where stretched out branches.
- b, b, b. The straight muscular Fibres, upon which the other circular do lye.
- C, C. The upper part of this Tracheal stem being whole or shut, that the Ring-like Gristles might appear.
- D, D, D, D. The branches of the Trachea constituting the lesser lobes are whole and shut, that the Ring-like Gristles may also appear in them.
- E, E, E, E. The like branches being cut open, that the holes and straight muscular Fibres may be seen together.
- F, F, F, F. The trunks from which the Tracheal branches being cut off are removed, that there may be space afforded to the rest, when cut open.
- G, G, G, G. The secondary little lobes hung upon the trunks of the Bronchii as grapes, which also may be divided into lesser lobes, the more inward passages of all which pass out of the Bronchii into the little bladdery Cells.
- h, h, h, h. The Vessels bringing blood crawling over the superficies of those little lobes.

The second Figure of the third Table expresses a part of the pulmonary lobe, wherein the membranous interspaces being blown up, all the little lobes appear in their proper figure, and do somewhat represent the leaf of Polypody.

- A, A. A part of the *Aspera Arteria* complicated with the other Vessels, to which trunk made up of all those, the little lobes grow like leaves of a tree.
- b, b, b, b. The little Lobes themselves.
- c, c, c, c. The Vessels bringing blood creeping through them.
- d, d, d, d. The membranous interspaces of the little lobes, which also are covered with c, c, c, c, the Vessels bringing blood.

The fourth Table expresses as well the Vessels belonging to the Trachea as those bringing blood, separate and distinct one from another, constituting one little Lobe, as also the peeniar framing of every one of them.

The

The first Figure represents the separating into divers parts the Tracheal branch distributed into one little lobe, and the branching into Pipes and orbicular little bladders.

- A, A, *The trunk of the Aspera arteria, in the superficies whereof the ring-like gristles do appear.*
- b, b, b, b, *The lesser branches going from that trunk, wherein also little Rings appear.*
- c, c, c, c, *The passages of those branches into orbicular little bladders, which seem like the clusters of Grapes.*
- d, d, *The Vessels bringing blood, distinct from the Pneumonic which cover the Trachea, and serve to nourish it.*

The second and third Figure shews distinctly the equal branchings of the Artery and Pneumonic Veins within the same little Lobe; both which being complicated with Tracheal Vessels, do for the most part make up the texture of the pulmonary frame.

The fifth Table sets forth the pulmonary Nerve more accurately described by the aid of a Microscope: so that it plainly appears that the Trunk is as it were a bundle of innumerable little Fibres bound together; moreover its Trunk, while it creeps into the lungs in the likeness of Mother of Time, doth spread the various little sprigs every way.

Fig. 1. resembles a part of the nervous trunk cut away, one end whereof being opened and lookt on by a Microscope, seems to unfold it self almost into innumerable little fibres.

A, *The trunk of the Nerve.*

a, a, a, a, *The little Fibres divided from one the other about the end cut off, and spread abroad.*

The second and third figure do shew some fibres as well of the trunk as of every branch, and moreover the slips of the little twigs from divers stemmes often repeated.

B. *The chief trunk.*

b. b. b. b. *The little fibres about the extremity cut off explicated.*

c. c. c. c. *The little twigs springing from the bundles of the little fibres.*

The sixth Table first sets forth the anatomy of the Artery bringing blood drawn in apt figures, which we have described in a late treatise.

The first and upper figures hereof, represent the four distinct Coats of that Vessel, viz. the nervous, muscular, glandulous, and the vasculous.

I. *The first inward nervous coat*, which perhaps is somewhat musculous, consisting of streight or long fibres, which being contracted shorten the Pipe of the Artery.

2. *The coat properly muscular*, consisting of a heap of small circular fibres, which when they are contracted successively under the stream of blood, do make its circuit to be shortened. It is from the motion of these that the arteries beat.

3. *The glandulous coat*, which (like that in the guts) being placed over the muscular coat, is weaved together of very small and most numerous glandules.

4. *The outward vasculous coat*, which variously folded together and wreathed, of Vessels bringing blood, and with slips and nervous fibres, seems like a certain little net.

The second and lower figures of the sixth Table, do shew the anatomy of the Vein, or its four coats expressed in fit places; which Coats do appear entire as successively taken one part from the other (beginning outmost.)

I. *The outward coat* consisting of nervous fibres (which perhaps are somewhat muscular) and as it were streight or stretch'd out in length, although not orderly.

II. & III. *The vasculous and glandulous coat*, which are the same as in an artery.

IV. *The most inward muscular coat*, consisting also of circular fibres, as in an artery, which being contracted behind the stream of blood, hastens its returning course.

The seventh Table expresses the distinct Coats of the aspera arteria, and separated one from the other.

The first figure shews the most inward Coat, endowed with streight or long muscular fibres.

The second figure describes the glandulous coat, and the third figure the vasculous coat (whhic

(which are almost the same as in the vessels bringing blood, and also in the Guts.)

4. *The fourth figure expresses the outward coat* (which is partly cartilaginous, and partly muscular.) The transverse or annular fibres hereof do fill up and weave together the interspaces of the Cartilages.

The eighth Table shews a part of the outmost pulmonary Coat covering over its whole frame, most finely and curiously described by the help of a Microscope.

The first Figure shews a portion of the above-mentioned coat, which partly by reason of the extremities of Vessels of every sort ending in it, seems pricked full of holes as it were, and partly from the complications of the vessels bringing blood, which like the twining sprigs of Vines gird about the orbicular bladders, is distinguished into many irregular *Area's*.

The second Figure represents a part of the outermost membrane separated from the clusters of vessels pull'd off, and without any *Area*, onely markt with little holes as it were with small pricks.

The third Figure expresses one singular *area* of the Coat above mentioned, augmented in largeness by the help of a Microscope.

SECT. I. CHAP. II.

Of the sundry kinds of Breathing hurt, and their causes, with the accounts of their Symptoms.

Hitherto we have strictly viewed the Lungs; and the parts any way serving their motions, and consequently the vital function; which being many and different, and the provision of the Organs as many very accommodate to breathing; so the same are many ways in hazard to be perverted or vitiated, upon sundry occasions. Truly a Watch framed with the greatest artifice with a Spring, with wheels plain and toothed, with chain and ballance, is not more prone or easie to be obnoxious to depravation than this Pneumonic machine of the breast, through which by sucking in air we preserve the vital flame of the blood with its motion and heat. For whereas the vessels of the lungs belong to the function of breathing, viz. the *Trachea*, with the *Bronchii* and little bladders; also the heart with arteries and veins, besides which there are nerves with fibres as well musculous as nervous, Lympheducts and Glandules; also the contents of these Vessels, viz. Air, the old and fresh blood, with its *Serum*, the Lympha, and the animal Spirits; any fault happening in any of these doth oftentimes discompose the whole Pneumonic function. Nor less also the moving Organs of the breast, viz. the muscles with the Diaphragma, and the nerves appointed to their use. And likewise sometimes the animal spirits before they enter into those nerves, being ill disposed, often cause great disorders in breathing.

The organs of breathing being hurt, the breathing is hurt also.

When the chief function and uses of the Lungs have been to convey the blood and air through the whole frames of the parts and their inmost recesses, and every their smallest passages, and every where to mingle them; namely for that purpose, that the venal blood returning from its circuit, and diluted with fresh juice, and thereby crude and as it were half extinct, may as well be more perfectly mix'd and wrought together, as more effectually kindled afresh in all its parts by the nitrous air; from hence the chief faults about this business or function of the Lungs do most of all consist in these two things. First, that the blood hath not due passage through the *Sinus* of the heart, and the pneumonic vessels: And secondly, because the Air is not drawn in and breathed out in a due manner into the *Trachea* and its passages. There are two parts of either of these: For first as to the passage of the blood, sometimes the fault is caus'd within the right *Sinus* of the heart, or the pneumonic Arteries; and also sometimes caused within the pulmonary veins, or the left Ventricle of the heart: Secondly, as to the Air, the failure is chiefly in inspiring and expiring; although each function offends sometimes equally. There are divers accidents of each, and many causes and ways of its being done, whereof we will here briefly touch upon the chief.

The uses and ends of breathing which use to be hurt.

The defects and failings of the Lung in its office.

First in respect
of the blood.

Therefore first, when the blood doth not duly pass through the right Ventricle of the Heart and the Pneumonic Arteries, either it happens by its own fault, or by the fault of those passages, and sometimes by the fault of further passages. For sometimes the stream of blood stops in the nether region of the *Præcordia*, by reason of obstruction in the other; moreover, sometimes the defect or fault of the air breathed in stops the free passage of the blood.

The opinion of
the famous Syl-
vius concerning
the blood fer-
menting in the
Lungs.

What relates to that fault of the blood, when it passes not quick enough through the right *Sinus* of the Heart and Pneumonic Arteries, the opinion of the Renowned *Sylvius* should here be discourd, but that it would be too tedious, and from our purpose. For he supposes, *The descending branch of the venal blood, moistned with chyme together with the lymphatic humour returning from the whole body, hath the nature of an acid-sweet spirit; and in the mean time its branch ascending impregnated with choler from the bladder of the gaul mixt into the mass of blood, does participate of an oily volatile salt; and so by the meeting together of these something contrary to themselves, a gentle and friendly contention or boiling is stirred up in the right ventricle of the heart, in which and for which the fiery parts lurking and being shut up in each, being freed and set at liberty, do rarifie the chyle and blood, and so change and alter them, that they exercise the function of life and heat as well as motion and nourishment through the whole body.* There are many reasons why I assent not to this ingenious and neatly-framed Hypothesis. For besides that many do far otherwise determine about the origine and dispensation of Choler, and so not without strong reasons and experiments are thorowly perswaded, (by eye-sight) that there is not any such boiling up of the blood of a different quality, and striving or contending in the right ventricle of the Heart: Our judgment continues still, as it hath been, that both streams of blood, washed thorowly with the fresh chyme, do consist altogether of one kind; and for that cause the milky Vessels of the Chest carry about part of the Chyle so long a journey, which they pour into the descending trunk of the *Vena cava*, just as the meseraick Veins pour the other part into its ascending trunk: also that the lymphatic humor together with the Chyle is poured into the subclavian Vessels, so that it may very commodiously be reduced into blood; neither truly doth there seem need of other or more passages. Moreover we determine that that humor rightly constituted doth agree with, and is easily assimilated to the mass of blood, as well as the Chyle it self made sweet, without any contention raised in the heart. But if the lymphatic humor returning from the Brain and nervous kind as well as from the Glandules, degenerate from its due temperature, and contract a sowness (as it often comes to pass) then being re-infused into the venal blood it overcomes it, and it precipitates it into ferocities, and from thence great streamings of urine do ensue. Moreover we have shewed elsewhere, that the Diabetes is provoked from such a cause. But such a flux of the lymphatic humor is so far from exciting a greater boiling up of the blood in the right ventricle of the Heart, that rather on the contrary from thence often chiliness of the whole or stiffness, with a weak Pulse, and sometimes swoonings or convulsive fits are provoked, accompanied with a plentiful and pale urine. The reason whereof without doubt is, that then the clear humor flowing from the brain and nervous parts, turns the blood into ferocities, and cools it by too much diluting; and for that cause the animal spirits being destitute of their vehicle, either faint or run into irregular motions.

which seems not
likely to be true.

Our opinion
hereof.

But truly as we altogether deny an Elastic effervescence of the blood in the right Ventricle of the Heart from contention of dissimilar parts; so as often as from thence the blood is not cast out into the Lungs after a due manner, we determine it to happen not so much from the proper fault and defect of the blood it self as from the animal faculty. For if the spirits actuating the moving Fibres of the Heart, either grow weary, or are forced into convulsive disorders; for that cause the Heart beating in disorder, drives out before it the blood either infirmly or irregularly.

The pneumonic
circulation of
the blood is stopt
sometimes by the
fault of the heart
it self.

But that the blood issuing out of the Heart doth not always with expedition pass through the Pneumonic Arteries, that sometimes happens from its own proper fault, and also sometimes from the passages obstructed, and also by reason of other causes. The blood it self in a double respect hinders its own passage through the Lungs, viz. either offending as to its kindling, or as to its temperature. There are fundry accidents of either of these. For first, even as the blood is more or less kindled than is convenient, it is hindered or obstructed in the pulmonary circuit: if at any time the watry, earthy, or fixt saline parts are predominant in the blood, the spirit and sulphur being consumed or brought low; by reason hereof its liquor being not well or less kindled by the nitrous air, is not easily rarified in the pulmonary passage, and scarce passes through them

2. Sometimes by
the fault of the
blood.

3. Sometimes by
reason of passa-
ges obstructed.

them like a flame of its own accord, but it sticks still in its passages, heavy and muddy, and creates much trouble and labour to the Heart wheresoever it is circulated. Hence as often as the blood is a little more plentifully forced into the *Præcordia* by the quicker motion of the whole body, or of its parts, the Heart and Lungs labour hard for its driving about, and that with the utmost endeavours. And in this case it is probable, that the blood carried more rapidly into the right Ventricle of the Heart, doth somewhat stagnate; because it cannot presently be carried into the passages obstructed before it. Moreover from this cause those grumous or fleshy concretions called the *Polypi* of the Heart sometimes seem to arise. Hence both in the *Pica*, *Leucophlegmatie*, *Dropie*, and inveterate *Scurvy* from the quicker motion of the body arises difficult and painful breathing.

The blood hindered in the Lungs sometimes because not kindled enough;

2. Sometimes the blood is too much kindled, and breaking out almost into a flame, and being above measure expanded, it can scarce be contained in the pulmonary passages (which it very much blows up and extends) but endangers them to be inflamed or kindled; wherefore lest it should tarry longer in them, the *Præcordia* beat with most frequent and strong endeavours, that the blood so over-much kindled might be ventilated and circulated: for otherwise it being carried within the Lungs, and inflaming them all over, would quickly destroy the vital function.

Sometimes too much.

Besides these things which concern the kindling of the blood, there are other faults as to its temperament or mixture, by reason of which it less freely or expeditely is conveyed through the pneumonic passages. For when its consistence is either too lax or too close, it will not easily pass through the small passages of the Lungs; but oftentimes is in hazard to stick and stagnate in them, and also run out and be extravasated.

It is also stoppt through its temperament being vitiated.

The blood being in a diverse manner made loose in its consistence, either deposes its Serum, or its dregs, or its putrefaction in the Lungs; which being lodged in the recesses of the Vessels, or affixed unto their sides, do variously stop or pervert the course of the blood.

1. The dissolution of blood, which is most commonly injurious to the Lungs, (although not very dangerously) is wont to happen, for as much as the serosities being unapt to be contained within the mass thereof, and when they are not presently sent away by sweating or urine, they separate from the blood within the Lungs; and so boiling up, and breaking out from their proper vessels, do as well disturb and stop the passage of air, as that of blood; so that for the sake of expelling those serosities and continuation of the circulation of blood, the Lungs are provoked into a frequent and very troublesome Cough. What the formal reason of this Cough is, and the manner of its being brought about, we shall declare hereafter.

When the blood is too much loosened in its consistence.

Though there are many causes and occasions, by which the serous liquor, departing from the loosened consistence of the blood, flows out abundantly into the Lungs; yet for the most part it happens from one of these three, viz. first and most frequently, because the Pores outwardly bound up by cold, cast back the serosities which were wont to be sent away by perspiration, into the mass of blood; which compel it presently to boil up, and cast off the serous superfluities in the Lungs. From this kind of cause Catarrhs and Coughs frequently arise, insomuch that the beginning of every cough by the vulgar is always imputed to such an occasion, to wit, catching cold. 2. The drinking of sharp and thin liquors, as Cider, Rhenish Wine, white Wine, *Paris Claret* commonly causes to some a Cough, or catarrhal distemper: the reason whereof is, for that the blood, weak in temperament, is presently dissolved and precipitated into serosities like milk by sower things cast into it, which flow plentifully from the mouths of the inward Arteries. I have experimented this upon my self yearly, when in the Summer season (when the blood abounds with sulphur) I have drank Cider and tartish Wines safely, yea frequently to advantage, the same in winter (when the blood is prone to sowness) but moderately tasted of, do presently provoke a Cough. 3. There is another cause of this serous inundation flowing out upon the Lungs, viz. when the *Lympha* watering the nervous and solid parts, doth suddenly suffer a flux; and for that cause it streams back into the blood out of the Fibres and Glandules, and other passages and receptacles; whose liquor it presently dissolves, and precipitates into serosities, which often infects the Lungs.

Why it lodges the Serum in the Lungs.

The various causes and ways of doing it.

For this reason a sudden and troublesome Cough frequently accompanies convulsive distempers, which being commonly called a vaporous Cough is ascribed unto vapours. Moreover in great alterations of air, especially when the season varies from dry into moist, and the volatile and fixed salts do thereby melt, the Cough and Catarrhs increase very much.

Neither doth the serous liquor only, but also many other humors or recrements of the blood lodged in the Lungs frequently stuff up their passages; so that by obstructing both the passages of air and of blood, they cause difficult breathing or a cough. This is every where perceived in ill-habited bodies, also in Gluttons and Drunkards, and others leading an inordinate and slothful life. Wherefore Foot-men use a thin and spare diet, that they may have their Lungs free from the filth and recrements of the blood. I have observed some melancholy persons, the adust *feces* abounding in the pulmonary passages, to have voided blackish spittle like ink; also others cholerick, and inclining to the Jaundice to void yellow, and sometimes very bitter, as if it had been meer choler.

The blood dissolved also lodges in the Lungs infections that cause corruption.

3. Moreover many instances manifestly declare, that sometimes the Lungs are tainted by the corruption and putrefaction of the blood. For the blood, toucht with an infection or a pestilent or venomous contagion, begins to be corrupted, and withdraw into clotted and corrupted portions; from thence the Lungs undergo the chief taint, from whence the greatest danger of life is threatned. This is too well known in the Measles, small Pox, Plague, and malignant Feavers, for me now to undertake to explicate it: by which maladies as often as the sick die, it seems to come to pass, either because the blood clodding in the vessels of the Heart or Lungs, obstructs the way of its proper course, so that presently its influx into the Brain is hindered, or because the corruption of the blood, affixt to the sides of the pulmonary passages, causes a Phlegmon as it were; and therefore provokes a most troublesome cough or difficult breathing, and frequently bloody spittle. So much for the impediments of the circulation of the blood, which happen in the Lungs by reason of the mass of blood too much dissolved, and apt to depart into parts and portions, (which being there left obstruct their passages.) There remain other no less prejudices to the *Pracordia*, which proceed from the consistence of the blood too much bound up together, and sending nothing from it self: by which a burning Feaver, Pleurisie, or Peripneumony arise.

The blood is hindered in the Lungs by reason of the too thick consistence of the blood;

As is perceived in a Feaver.

In the former distemper the blood being more sulphureous than it ought, and therewithal being thick, is not diluted enough with its Serum; and those particles of it contained within it self, it puts away with great difficulty: wherefore it is more plentifully kindled in the Lungs; and when it passes through the passages hereof with more difficulty, by reason of its greater boiling, and of its thickness, the Heart beating quick and most vehemently, endeavours its circumpulsion with all its might; notwithstanding from its greater flame growing hot within the *Pracordia*, heat and a most troublesome thirst, with roughness, and as it were a certain parching of the tongue arises.

In a Pleurisie and Peripneumony.

In the other kind of distemper, viz. a Pleurisie and Peripneumony, the blood is alike thick, but less sulphureous, and inflammable; wherefore it doth not participate of such a burning: yet by reason of its thickness it doth not so easily and quickly pass through the Chest or Lungs, is frequently extravasated, and sticking to the inter-spaces or sides of the passages, causes obstructions, and soon after an inflammation, to which pain often succeeds with bloody or discoloured spittle. We may observe in blood-letting in these kinds of distempers, that after it hath settled, its superficies is covered with a little whitish skin, or otherwise discoloured, but always with a thick and viscus: the reason whereof is, that the blood, when it doth not send away in the circulation its old particles, nor doth admit enough of new, it is thickened with a continual boiling, and like boiled flesh changed from a bloody colour into a whitish; in which state, passing with difficulty through the small passages of the vessels, it is in danger to be extravasated, and easily provokes a Pleurisie or Peripneumony.

The blood is hindered in the Lungs by the fault of the heart.

1. when the spirits thereof are wanting.

Besides these stoppages of the blood, caused by its own fault, while it passes through the *Pracordium*, there are also other impediments, which happen either by the defect of the Heart, or its passages, or by the fault of the air inspired. By what means and for what cause the Heart offending in its motion, forces the blood from its right ventricle through the Lungs into the left irregularly, we have clearly shewn in our late Tract of Cardiac Distempers: to wit, that muscle sometimes labouring for want of spirits doth not vigorously and strongly enough perform its beatings. For when in corporal exercise the blood more plentifully than usual, is forced from the *Vena cava* into the ventricle of the Heart; if this cannot firmly contract it self, labouring according to its strength, it causes frequent and weak Pulses: moreover to help this, as well the Pneumonic Arteries, as others in sundry parts of the body, which drive about the blood every way, do cause frequent and inordinate contraction. Thus I have observed in Virgins afflicted with the Green-sickness, and in other cachectical bodies, from a quick motion of the

the body, not only a palpitation of the Heart, but in the neck, temples, and other places the Arteries to have beaten irregularly. Neither is it the want of spirits only, but their disorder is sometimes the cause that the *Præcordium* doth with less strength convey the blood; for sometimes the spirits, the inmates of the Cardiacal nerves, being stirred up by an incongruous conjunction, and affected convulsively, do impress their irregular contractions upon the Heart or Arteries, whereby the progress of the blood is several ways perverted or hindered, as it often happens in Palpitation of the Heart, Trembling, intermitting Pulse, and other the like passions.

3. The pneumonic process of blood is variously stopt, because the passages are not open enough: which impediments happen as often as the Pores or those passages are either stopt or broken. Of the former there are two reasons, viz. sometimes the ways are shut, for as much as the passages of the vessels, contracted by the carneous fibres, are brought nearer one another; as we have elsewhere shewed, doth sometimes happen in Palpitation of the Heart, and a convulsive Asthma. The affects of which sort, by reason of the stream of blood shut within the *Præcordia*, difficult or hard breathing, a small Pulse, and chiliness of the whole body are wont to accompany. Moreover sometimes the course of the blood is shut up, because the passages of the vessels are pressed together by a body, or by some humor from without: wherefore when the little Cells or bronchial Pipes (as is usual) are filled with a viscous slegm, purulent matter, or blood extravasated, as the free passage of the air is hindered in them, so also the passage of blood is stopt in the vessels adjoining. On the same account come tumors, little swellings, worms, also stony, sandy, and curdly concretions, and others of another kind are in diverse manners excited; the chief whereof we shall touch on hereafter. Moreover we sometimes see the canals as well of an Artery as of the pneumonic Vein, made very bony in some part, and their sides so compressed, that a very small chink remains for the blood to pass. Not long since we dissected a young man who died by reason of an ill formation of the pneumonic Vein, in whom the trunk of this vessel growing stony near the juncture to the heart, did stick so close, that the blood did drop into the heart only by drops, or by a very little stream. 2. That the passages bringing blood are often filled and stopt, inasmuch that the stream of blood is obstructed or straitned, many anatomical instances and observations manifestly declare. From thence it appears, that grumous, or as it were carneous concretions of the blood do frequently so stop the ventricles of the heart, and the roots of its larger vessels, that the course of the stream of blood is almost entirely stopt. Moreover reason persuades, and experience concludes this more frequently to happen in the lesser vessels: for seeing (as we have even now intimated) the blood emitted by Phlebotomy in Rheumatisms, Peripneumonies, and Pleurifies, when it is cold is covered all over with a thin skin altogether of the like substance with those concreted Polypus's; it plainly appears, that it passes with difficulty through the passages of the lesser vessels by reason of those viscous excrements: wherefore that it may pass by some means, it distends them very much, and sometimes breaks quite through them, also it frequently unlocks their mouths, and opens gaps into the *Trachea*, inasmuch that portions of the extravasated blood are by coughing frequently ejected. We have known some to have died Asthmatic or short-winded, whose Lungs being free from an Ulcer, or any more grievous wound, have swelled so much, that they wanted room for their motion within the cavity of the Chest: the reason whereof doubtless was, that the thicker and more feculent blood, for that cause not easily passing through those vessels, every where extended the Arteries and Veins, and caused it to stagnate in the lesser Pipes. Moreover the feculencies of blood one while salt of different kinds, another while sulphureous or earthy being combined with them, and thrust into the small passages of the vessels, and fixed there, do altogether obstruct them; inasmuch that the pneumonic circulation of the blood is contracted into a shorter space, and consequently the function of breathing is straitned in the compressed Pipes or little Cells. There are many kinds and sundry ways of such an obstruction, which if all or the chief should be enumerated, such a Pathology would swell into a too great bulk.

3. The pneumonic passage of blood is not only hindered by reason of the passages shut and obstructed, but sometimes also being burst asunder. For those vessels being small, or tender, or very loose in some persons, are frequently opened by the force or acrimony of blood; so that the blood either bursting into the *Trachea*, is ejected by spitting, or heaped up in the interspaces of the passages, causes a Peripneumony, or falling down into the cavity of the Chest, produces an Empyema. Of all these we shall treat singly in the Chapter of Spitting of blood.

2. Because moved inordinately.

3. The blood is hindered from obstruction of the passages, which are shut up divers ways. For divers causes here rehearsed.

The bronchial Pipes are filled.

Sometimes wax hard.

The vessels are stuffed with concretions resembling the Polypus.

The blood is also hindered because the passages are burst asunder, as in spitting blood.

There

*One impediment
of the blood is
want or default
of air.*

3. There remains as yet a third impediment of blood in the pneumonic passages, which happens for the want or fault of Air. If at any time the Blood is not kindled after a due manner within the passages of the Lungs, from air breathed in by the *Trachea*; for that cause as presently its flame is irregular, so likewise its motion is variously stopt or perverted: for although the blood is forced through the lungs by the meer impulse of the heart, notwithstanding the pulse hereof is proportioned according to the tenour of its being kindled by the air; wherefore when the flame of blood is diminished, or suppressed, for want or through the fault of the air, presently the pulse proves languid or unequal, and by reason of the bloods course being troubled, or stopt, presently a paleness and coldness succeeds throughout the whole body, with enervation of the members. But if inspiration be wholly intercepted or frustrated (because the nitrous particles are wanting) presently the pulse ceases, and anon life is lost. The reason of all which is, both because the blood being much impeded in its accension, or extinct, like Must given over working presently subsides, and is unapt for any motion; and chiefly because the flame of the blood failing, and being subtracted from the brain, presently the *Hypostasis* of the animal spirits, as it were light streaming from thence, immediately fails, and together with it the exercise or actions of all faculties do cease. But if the blood is too much kindled, the Sulphur of the Blood, and the Nitre of the Air running together more than it ought; for that cause presently, that this too much burning may be eventuated enough, the pulse of the heart is increased to its utmost. We might adde many instances of this kind; but truly this consideration of the blood leads us to the second thing proposed of Respiration hurt; namely that we may duely weigh, what sort of failings or defects do happen about the inspiration as well as expiration of the Nitrous air, requisite for the preserving the nitral flame of blood; that is to say, from what causes they proceed, and also what effects they are wont to produce; in which search we will first treat of Inspiration hurt.

SECT. I. CHAP. III.

Of Inspiration hurt.

*Breathing hurt
by the vicious
qualities or de-
fect of air.*

*The faults of
the air.*

Breathing is accounted hurt, when its use is frustrated, or any ways hindred; which most frequently happens, by reason of the fault or defect of the Air drawn in. As to the former, if the Air chance to be depraved, it neither duely kindles nor eventilates the blood, yea it sometimes overthrows the temperament thereof, or infects it, as is every where seen in a Constitution of Air very malignant. That we may touch on the chief reasons of these distempers, we are to observe, That as the Nitrous particles of Air are chiefly necessary, (as is manifest by manifold experiment) for the preservation of life; so frequently it happens that Nitre of the Air either to fail or be wholly wanting, or by particles of another kind to be so much muffled, or bound up, that they cannot enough exercise their vital power; or lastly, malignant or fatal Corpuscles to be adjoyned thereunto. First, the nitrous particles of Air are deficient, if when it stagnating or growing hot the Nitre is chased thence, or not stirr'd into action. Wherefore, in a low-rooft Chamber, or too close, and in other places crouded with assemblies of men, or made hot with the ardor of the Sun, we difficultly or weakly breathe. The same comes to pass in places of great height, on the tops of those mountains exceeding the top of the *Atmosphere*; wherein breath is faintly drawn for want of Nitre, neither can we live long there. Secondly, the Nitrous particles of Air are wont to be obscured or blunted by other accessories, also sometimes they are too much sharpened. For as often as the South-wind blows, the Air is too moist and thick, inasmuch as the Nitrous particles are seiz'd upon by the watry and sulphureous, and are much blunted, so that while it is drawn in, the blood is not vigorously kindled, but like green wood put into fire it rather smokes than burns bright; wherefore during such a state of Air we become stupid and dull, and unapt for motion; but on the contrary, the North-wind blowing, the cooling, sharp and most nipping particles are adjoined to the Nitrous, and the blood is enough kindled, and we breathe freely; yet the Vital flame is every where restrain'd by intense frost disproportion'd thereunto, and unless refresh'd by motion and heat, it is frequently entirely extinguished.

2. Be-

2. Besides these faults of the Air, whereby breathing is wont to be hurt, moreover this evil sometimes proceeds from its defect; inasmuch as it cannot be drawn in in plenty enough. Of which effects though there are many and divers causes, yet for the most part it happens in respect of the organs of breathing, either hindred as to their motion, or their passages obstructed.

The defect of air hurting breathing, proceeds from the pneumatic Organs.

1. The Organs of breathing are either merely passive, viz. which are moved, as the Lungs; or are Active, and move themselves, and those together, as the muscles of the Chest and Diaphragma. In every of these the impediments of the motion by which breathing is hurt, happen variously. And first what respects the Lungs, we mentioned before, that they sometimes very much swell, by reason of the vessels being much distended, and fill'd with blood, inasmuch as being stiff and inflexible, they obey not the turns of the Systole and Diastole of the Chest. Moreover it happens sometimes through a phlegmon, little swellings, and other concretions of divers forms, that a like stiffness is caused in them. Secondly, the active organs of breathing, or the moving parts, viz. the muscles of the Chest and Diaphragma are wont to be perverted or stop't from their moving function by divers causes. A solution of continuity made in any part of these, either by clotting of blood, or by falling down of the Serum, and other humors, as in the Pleurisie and Scurvy, or in those that are wounded or bruised, doth every where cause pain in the place affected, with impotency of motion and difficult breathing. Moreover, sometimes without pain, or any evident cause, those parts being hindred from their motion do produce a most heavy purfiness; As is frequently seen in an Asthma, Suffocation of the womb, and in certain other convulsive or hypochondriac distempers. The reason of which passion without doubt consists in this, for that the animal spirits appointed to the moving function of those parts, are disturbed about their Origine, or hindered in the passages of the Nerves, and are turned aside from their due influx into the moving fibres: Inasmuch as many who are found enough as to their Lungs, and only obnoxious to affects of the Brain and Nerves, are frequently surprized with horrid fits of an Asthma, as we have at large declared in another place.

2. The stopping of air, hindering breathing, whereby it less freely enters the Lungs, frequently happens, by reason of the Conveyances, viz. the passages of the Trachea being shut, or not enough open. For indeed those passages are wont to be stop't (as we have formerly observed touching the Vessels bringing Blood) and prohibit the full entrance of air, when they are either obstructed or compressed, or more narrowly contracted. Though there are many causes and ways whereby the passages of the Trachea are wont to be obstructed; yet chiefly and most often a Catarrhal distillation of the Serum, while it departs from the blood, and flows out of the vessels bringing blood into these parts; which being first thin and sharp, produces a troublesome Cough; afterwards thickening by digestion, and cleaving to the sides of the Trachea, exceedingly straitens the ways of inspiration, and shortens them by quite stuffing up their extremities. In like manner the sweating out of extravasated blood, as also of Pus or ichorous matter out of the Lympheducts or Veins into the tracheal little bladders, doth frequently produce an Asthma, and often a Consumption; the reason of which sort of distempers shall be more largely explained hereafter. Secondly, it is manifest enough by common observation, that the Tracheal passages as well the last as the intermedial, often-times are straitened, or shut, by compression. For after a plentiful meal, or abundant drinking of Wine or strong Ale (inasmuch as the pneumatic vessels are very much distended by reason of the turgency of blood, and the sides of the Trachea being press'd together, do not admit of a free and usual entrance of air) men otherwise healthful enough, do breathe difficultly and painfully: Which truly we esteem to happen from the lungs being filled and extended rather, than from a cram'd stomach hindering the Systole of the Diaphragma. Moreover, for this reason, even in the very paroxysms of fevers a frequent and painful breathing is manifest. Neither onely from the turgency of blood, but also from the same stagnating, or extravasated, and also from stony concretions, and divers other manners, the vessels of the Trachea being press'd together, cannot discharge a free breathing.

The various ways of Obstructions.

A Catarrh.

The swelling of blood by which the passages are press'd together.

3. The passages of the Trachea being sometimes more nearly contracted and closed from their fibres convulsively disposed, deny a passage to the Air for due breathing. From hence, when there is no obstruction, or ill conformation in the lungs, as also no consumptive disposition, yet from those fibres preternaturally convulsed and drawn together, dreadful fits of an Asthma frequently arise. Whereas we have in another place

The cramps of the tracheal passages.

place discoursed of these passions, it will not be requisite here again to repeat that discourse. Besides these accidents of breathing hurt, there are certain others which are stirr'd up by reason of the Air prohibited in its first entrance, *viz.* in the Nostrils, the throat, the *Larynx*, from a tumour or ill conformation: For the *Polypus* in the Nose, the *Quinzy* in the Throat, or inflammation of the Tonsils, do render a difficult breathing; in the same manner as a heap of sand about a Haven, obstructs the ingress and regress of Ships. But truly since the reasons of those passions, and their manner of being made, are expos'd to sense, it seems superfluous here to deliver their causes.

SECT. I. CHAP. IV.

Of Expiration hurt.

The act of expiration is easier than of inspiration.

AS Expiration is much easier, and with lesser trouble performed than Inspiration, so it is less endangered to be stopt or perverted, as to its function: for in truth the contractive endeavours of fewer muscles are required to perform that, insomuch as some do affirm that the meer relaxations of the moving parts, whereby the dilatation of the breast is discharged, doth suffice for its constriction. Hence when in the agony of death, the ultimate labour is to open the breast, and fetch breath, by which the flame of life may be continued; as soon as that endeavour is become frustrate, the animal expires, and is readily extinct. But truly we have already clearly enough evinced, that the tasks of breathing out, no less than those of breathing in, are performed by the help of peculiar muscles. Wherefore, when it happens that the Organs of Expiration are either hurt or prejudiced, there must needs follow difficulty or depravation of that function. The moving parts, which bind together the breast, and straiten the cavity thereof, are especially the inward muscles of the breast, some belonging to the Loyns, and others to the Abdomen; as also the muscular fibres of the *Larynx* and *Trachea*; by reason of some faults, occupying sometimes these, anon them, either single or many together, expiration is wont to be stopt or perverted after a diverse manner. Although the hurt of this function frequently depends upon inspiration being prejudiced; notwithstanding it sometimes happens alone; so that when we suck in Air easily and duely enough, we return it disturbed or perversly, which truly is wont to come to pass through divers causes, and after many manners (the chief of which we shall here briefly touch upon.)

Expiration hurt sometimes proceeds from the fault of inspiration.

Sometimes being alone depends on various causes.

1. On the wound of a part moving.

2. In a Cough.

The description of a Cough.

Its formal reason and the manner of its being done.

1. For first, when a wound, or convulsive or paralytical distemper happens in one muscle (which causes expiration) or in more, for that cause the cavity of the *Thorax* cannot be so freely drawn together and compress'd, for the more full breathing out air or breath. Hence not only such as labour in a *Pleurisie*, but in a tumour or wound in the intercostal muscles or the Abdomen, cannot easily cough, or sing, or perform other acts of stronger expiration: Neither is the due drawing together of the *Thorax* less stopt, by reason of the moving fibres of those parts affected either by a resolution, or a cramp.

2. The act of expiration, whereas it is variously perverted or disturbed, so it chiefly happens in a cough, in sneezing, in laughing, in crying, and in Hiccough; into the reason and manner whereof we will briefly enquire; And first we shall speak of a Cough.

A Cough may be described, that it is a vehement, more frequent, unequal and loud expiration, stirred up either for the quieting of some troublesome and provoking thing, or for expelling of it out of the Lungs through the passage of the *Trachea*. For air being violently excluded, and dash'd in the way on the sides of the Tracheal passages, whatsoever is in any place impacted in them, if it be easily moved, it diffuses and wipes it away, and frequently sends it out of doors.

For the exciting of a Cough, both the muscles contracting the *Thorax*, and also the moving fibres of the *Bronchii*, do concur in motion with a joynt force together. For while the muscles straiten the cavity of the breast, and every where squeeze the whole lungs; these fibres one while contracting these tracheal passages, another while them, closing behind the air while it is driven forwards, do endeavour its expulsion more quick and vehement.

A more intense sudden inspiration precedes every act of a Cough, to wit that the air being admitted in greater plenty, may presently be more violently driven out with noise; in which endeavour not only the new that is fresh breathed in, but also the old, being heaped up before in the tracheal little bladders, is driven forth together with a noise, for the increase of breath blown out; and when what is troublesome is not settled nor removed at the first assault, the vehement expiration of this kind is repeated by a frequent course, even to the great wearying of Nature.

The first cause of every Cough is an irritation of the nerves or fibres belonging to the lungs; concerning the nerves we are to observe, that not only the branches and their slips inserted into the Lungs, but others from which they do arise, or with which they do intimately communicate, being provok'd in places far distant from the breast, immediately cause a cough: for which cause oftentimes a sharp humour being lodged within the Brain, and from thence falling down into the little head of the pectoral nerves, is wont to produce a most troublesome Cough or Asthmatick distempers, as not long since we have declared by notable instances. For the same reason a pain inflicted on the nostrils, palate, or *Gula*; provokes a Cough, or rather a vain attempt of coughing. Moreover a little *Serum* distilling from the Arteries into the upper parts of the *Gula* or *Larynx* produces a frequent and very troublesome Cough, without any notable prejudice of the Lungs. But truly this provocation, inflicted on the nerves and fibres distributed in the Lung it self, more frequently, and truly more violently provokes an endeavour of Coughing, which is repeated by courses, till what is troublesome be turned forth, or the provocation restrained. Of this kind of Cough from the nerves, a notable Example shall be after set before you.

The provoking causes producing a Cough are manifold, and make their stay in several places: for besides that the nerves, as we but now intimated, and also the membranes, with which there is an intimate communication with the Lungs, being provoked in the open Nostril, give an impression of that passion at a distance to the Lungs; most frequently that irregular expiration is stirr'd up, by reason some incongruous or in some measure unproportion'd thing is cast into the Lungs. For in the first place, that this troublesome thing may be removed, the nerves and the nervous fibres dispersed about the Lungs are irritated; afterwards by the consent of these, the muscles of the breast that draw it together, and the moving fibres of the Trachea at once are forced into vehement and often repeated contractions.

Every Cough is either moist or dry; in the former a certain humour being deposited in some place within the tracheal passages is shaken by coughing, and being to be thrown out upwards is cast into the mouth. That humour, whereas it is manifold and after divers sorts, for the most part it is either call'd serous, or nutritious, or purulent, or bloody.

Of the former there are many kinds and differences; namely, as to its consistence it is either thin, or thick, or crude, or digested; as to its colour, it is either white or yellow, or somewhat greenish; also sometimes it is blewish, or black. Moreover, a moist Cough is variously distinguished, as to the places from whence the humour to be coughed out proceeds. For sometimes cleaving to the sides of the *Larynx*, or sweating from them, the moving fibres being shaken by a gentle little Cough, it is easily and by a short passage cast forth into the mouth; sometimes the matter to be excerned, being impacted a little deeper in the pipes of the *Bronchii*, is not shook out but by large expirations, and often repeated; and lastly it sometimes happens, that the excrements to be cast out, are deposited within the farthest little bladders of the Trachea, out of which it is not brought forth without a vehement labour of coughing, and that frequently repeated, and at last driven forth by a long journey through the whole lungs. Concerning the Cough of a nutritious humour, as also of a bloody and purulent, hereafter it shall be discoursed when we treat of a Consumption and its remedy.

A dry Cough, as often as it is the proper passion of the Lungs, is excited after many manners and by sundry causes; for an obstruction of any of the pneumatic passages, whether it be by compression, or oppletion, or contraction, doth necessarily induce this. Wherefore an inflammation, a tumour, a little swelling, a stagnation of the blood either through plenty or scarcity, also gravelly, stony, or polypose Concretions, worms and many other preternatural things, inasmuch as they almost perpetually provoke the nervous fibres, do induce a dry, vain Cough, but very troublesome. But

a dry Cough sometimes is stirr'd up by the instinct of Nature, as in place of a Pump; to wit, that the blood either by reason of its proper ill temperament, or by reason of the pneumatic Vessels not being open enough, not passing well through the lungs, may be promoted by the shaking of these parts, and forced into a more rapid motion.

What belongs unto the other acts of expiration hurt, as when in sneezing, hiccough, laughing, crying, and in other affects its natural and even function is troubled or perverted; seeing the rendings of the causes of these (which also in another place we have in part designed) do not properly appertain to our purpose, omitting them here we will pass to the thing chiefly designed, viz. to the diseases of the breast and their remedies, and to the reasons of curing them.

SECT. I CHAP. V.

Of a Phthisis or Consumption in general.

WHereas we have hitherto viewed the fabrick of the Lungs accurately delineated, and the motion thereof together with that of the whole Breast, and the ways and passages of the air, and of the blood, and of other humors through them; and have also observed their various impediments, their remora's, or diversions, according to which it happens the act of the pneumatic function is after a diverse manner hurt or perverted in inspiration and expiration: now in the next place we are to descend to the Pathology of this region so travelled over, and, which was our design from the beginning, to treat of Medicines belonging to the *Thorax*, or Remedies appropriated to heal the distempers of the Breast, and the manner of their operation.

A Phthisis accounted chief among the diseases of the breast.

Of all the diseases of the Breast a Phthisis, or Consumption, by right claims the first place: for there is none more frequent or difficult to cure. Moreover all the other affects of the *Thorax* being ill, or not at all cured, do lead into this, as lesser streams into a greater Lake, and so ending in a Phthisis, lose both their natures and ancient names.

The various acception of Phthisis.

But truly these terms of *Phthisis* and *Tubes* in their proper signification denote an Atrophy, or a withering away of the solid parts with debility of strength: the distempers of which sort frequently proceed from a wound or Ulcer of the Lungs; notwithstanding sometimes without any fault of these, the extenuation or pining away of the whole body takes its rise from the meer fault of the blood, or chiefly from the nervous juice. Therefore before we handle a private pulmonary Phthisis, seems to our purpose to explain the general reasons of this sickness, and to declare how many ways, and from what causes the ill temperaments of the humors are wont to induce a privation of nourishment of the whole body, as it were consumptive. For truly the Consumption of the Lungs it self doth not next and immediately proceed from an Ulcer or corruption of that bowel; but it arises for as much as the blood from them contracting a corruption, and highly defiled, for that very cause loses altogether its nutritive virtue. Moreover as well this as the nervous liquor acquires such an indisposition. Of which in general we will now inquire.

An Atrophy first depends on the blood made unfit to nourish.

And first what relates to the Blood, we may often take notice, that some pine away without a Cough, or without any apparent fault either in the Lungs or Breast; in the mean time as to appetite, digestion, sleep, and almost the oeconomy of the whole natural and animal function do carry themselves indifferent; notwithstanding, as if nourishment should be poured into a Receptacle bored through, they are not nourished, but pine away sensibly mangre all Dietetical Rules. The formal or conjunct reason of which kind of affect frequently consists only in this, that the blood being notably depraved, cannot assimilate the nourishing juice continually mixt with it; wherefore it doth not only forthwith send it away, but also takes away some particles of the solid parts; which snatching to it self, it presently throws out, or casts it into some place or other, or consumes it by evaporation.

The depravations or degenerate states of the blood, that are wont to induce an Atrophy, either consist in its proper distemper, or themselves are communicated from some other place, and indeed chiefly from the bowels, or from the nervous liquor being also degenerate.

The

The proper Dyscrasie of the blood it self is twofold, according to which it happens, that the saline-acid particles or the sulphureous and most sharp are exalted above measure, and predominate over the rest. For sometimes the blood withdraws it self from its genuine disposition, *viz.* a sweet and volatile into an acid, as is always found in scorbutical, melancholy, or cachectical persons. Wherefore the nutritious juice being ever mingled with the bloody mass, seeing it cannot for that reason be assimilated, and affixed to the solid parts, is released again in a short time; and is either forthwith sent away by urine, sweat, or a Diarrhoea; or being pen'd up within the flesh or cavities of the bowels, brings a Droplic: of which sort of distempers, being led forth into an evil state, the ordinary effect is wont to be, that when some parts do swell very much, other parts are very much extenuated. Here it would be far from our purpose to deliver the true cause of the above-mentioned affects, and to put our sickle not only into another man's harvest, but also one far remote. 2. Moreover there is another state of blood unfit for nourishment quite contrary to this, to wit, when being above measure hot and sulphureous, and from thence always violently burning out, it consumes the nutritious juice by its effervescence and raging, and causes it too much to evaporate; so that the solid parts being defrauded of their provision pine away. The persons obnoxious to this distemper have large vessels, and much distended with blood, but their flesh withered and hardened by heat. Though persons so affected seldom pine away to death, yet they grow old sooner, and end their life in a shorter space.

The consumptive Dyscrasie of the blood either from it self or communicated from other parts.

1. The kinds of the former are reckoned up.

2. The blood not only from its proper *indoles*, but also by reason of a Consumption elsewhere, and chiefly communicated from the bowels and nervous juice, is often unfit to nourish. And first this frequently happens by fault of the bowels; for these being ill-affected, sometimes do not duly digest the Chyme to be conveyed over to the blood; also oftentimes they pervert and defile it with their extraneous and heterogeneous ferments, insomuch that the functions are frustrated in the faculties of breeding good blood and nourishment. Moreover sometimes by reason of the Vessels bringing the Chyle obstructed within them, though much be eaten, yet little or less than due, is conveyed into the bloody mass. Also in the bowels of concoction sometimes Tumors, Imposthumes, and Ulcers happen; from whose corruption the blood being infected in its passage, contaminates the rest of the mass, and renders it unapt to the work of nourishing. How often do we see from a Schirrus happening in the Spleen, Liver, Pancreas, or Mesentery, or by an Ulcer or cancrus Tumour of some Gut, as also of a Kidney, Womb, or Bladder, or otherwise malignant Sore, a deadly Atrophy to have succeeded without any notable fault of the Breast or Lungs? Yea Tumors, Imposthumes, or cancrus and strumous Ulcers happening in the outward parts, and especially in the Back, do frequently end in a pernicious Consumption. The reason whereof is plain, *viz.* in as much as in such distempers both great plenty of the nutritious juice brought to the affected part through the Arteries, is either entirely bestowed in the same place, or from thence is poured forth abroad, insomuch that all the other parts of the whole body are defrauded of their due provision; as also that the virulent or very incongruous matter there engendered and lodged is swallowed up by again the Veins, which defiles the blood by an impure black gore, and from thence renders it altogether unapt to discharge the faculty of nourishing.

This proceeds sometimes from a fault of the bowels or solid parts;

Or from the nervous juice.

Neither only from the bowels and solid parts, but also from the nervous juice the stain (by which it becomes unfit to nourish) is frequently communicated to the blood. For when this liquor degenerates from its genuine temper, to wit, sweet and volatile into an acid, presently flowing out of the fibres and nervous parts, and flowing back into the blood, it doth precipitate the liquor thereof, and compels it into fluxes, whereby all the nutritive matter is cast forth, and one while poured forth by Urine or Sweat, another while by Vomit or Loosness. The reasons of all these, and how they come to pass we have explicated in a late Treatise.

But the nervous liquor, sometimes by it self, departing from its good temper, and being vitiated in its temperament, is a cause of want of nourishment, which also happens to be made in a twofold respect, or two manner of ways. For sometimes that Juice being very much vitiated and degenerate, proves as it were vappid and decayed; so that it doth not actuate enough the fibres as well nervous as carnosus, and inlighten them with an animal spirit: wherefore as the motive virtue, so also the nutritive fails in the solid parts. From hence either the entire body, or certain members and parts thereof being for some while affected with a Palsie, at length they wither away: as we have at large declared the reason thereof in another place. 2. We have

The nervous juice sometimes of it self is chiefly the cause of an Atrophy.

also observed, that many labouring with a slow Fever (or as called by us a nervous) do presently languish, and in a short time become much emaciated. In either case the same reason ought to be assigned; for, as is shewed in another place, seeing the animal spirits, together with the nervous liquor, their vehicle (which is as it were the masculine seed) do actuate the nutritive humour every where collected by the solid parts even as the feminine seed, and render it as it were pregnant with a nutritive faculty; for that cause if that nervous liquor becomes either depraved or vapid, the bulk of the solid parts pines away as if it were made barren.

Two chief kinds
of Atrophies.

So much of these things touching an Atrophy, or waxing lean, and the formal reasons thereof, the causes and various manners of its coming to pass in general. Of this disease as there are many kinds and differences, so two chiefly and more observably occur, whereof either will deserve a particular consideration; viz. *Tabes* or *Phthisis Dorsalis* commonly so called, and a Consumption of the Lungs. This latter, which properly belongs to this place, shall be discussed in the following Chapter; in the mean time concerning that (because the knowledge thereof doth illustrate the Pathology of this) we shall speak in a word.

Two kinds.

From the nervous
juice stopt or de-
praved in the
loins.

Tabes Dorsalis, although it hath almost lost its name in this our Age, or perhaps changed it into a Gonorrhœa, yet *Hippocrates* makes mention of it, and handling it avowedly, he assigned a twofold kind thereof, viz. one from immoderate Venery, and the other from a destillation into the Spine of the Back. What relates to the latter, I have often observed some to be most grievously vexed with a pain about their Loins, yea sometimes in the whole Back, which when for some time some have so laboured under, they afterwards come to be lame or crooked, and at last fall away in the whole body, all but the head. The cause of which disease doubtless consists in this, viz. first a humour or a certain incongruous morbid matter, descending with the nervous juice through the spinal marrow, did run into the branches of the vertebral Nerves, and therefore from the beginning, by reason of the Fibres being twitched, a continual pain almost did arise; afterwards by reason of some Fibres being resolved, the opposite ones more vehemently contracted distort certain Vertebra's of the Spine; and lastly seeing the animal Spirits cannot actuate enough the Nerves and Fibres belonging to the trunk and members, by reason of the nourishment frustrated, the withering of the entire body succeeds. Surely when the nervous liquor and animal spirits pass not fully and freely out of the Dorsal Spine into the whole body, from thence oftentimes a pining doth arise: hence Imposthumes and Ulcers arise about the Loins or the *Os sacrum*, which in as much as they consume or pour forth the nervous liquor too much, cause an Atrophy in the whole, or at least in the lower parts.

From the ex-
pense of the hu-
mour through
the genital
parts.
That humour
is first either
seed, a too great
expense where-
of induces an
Atrophy.

2. Another kind of *Tabes Dorsalis* far more frequent, is also twofold: viz. it either ariseth from the great or too-often loss of the genital humor, or from a continual corrupt flux from the genital parts.

1. As to the first, it is manifest by vulgar observation, that the immoderate use of Venery, yea involuntary efflux of the seed, if it be either great or continual, produce a faintness in the whole body, and at length a pining away. The reason of this (as we have intimated in another place) is not, that the seed, according to the opinion of some, descends from the Brain through the Nerves into the spermatic bodies, and from thence, by reason of a great loss thereof first the Brain, and then the parts, all depending on the influence of the Spirits springing from thence, become infirm and pine away. But seeing we have sufficiently evinced, that the seminal matter is immediately supplied out of the mass of blood into the genital parts, and that it is altogether the same with that out of which the animal Spirits instilled into the Brain are procreated, it will necessarily follow, by how much the greater portion is got to the Testicles for repairing the loss of seed, by so much is the Brain defrauded of its due share, and therefore at length the function in the whole body, as well motive as nutritive, doth waver and diminish. Our furious Whoremongers are sensible of a great debility about their Loins, and the parts placed below them, to wit, the Thighs and Legs, do chiefly wither away; the reason is, because as well the provision of the animal Spirits in its first spring, viz. in the Brain failing, the outmost chanel, viz. the ends of the spinal marrow, and the Nerves springing from it, do suffer first and chiefly for this defect; and moreover because near the Loins the arterious blood gives out to the Testicles more excellent particles and chiefly restaurative, being destined to nourish the Back, and in the mean time the venous blood being for that cause decayed or consumed, is enfeebled, and steals from the Loins as much as possibly may be.

The

The loss of the seed causing a Consumption is sometimes voluntary, of which sort the salacious and prone to Venery do suffer: sometimes involuntary; of which affects there are divers kinds. For in some it only happens by dreams or obscene phantasms; but in others, besides those occasions, every endeavour of the Back, whether through bearing a weight, or excretion of Urine, or the *faces* of the Belly, causes the genital humor to be thrust out: the cause whereof is, both because the seed is watry and thin and at once sharp and provocative, also because the parts are weak, and not able duly to digest or retain it.

The losses whereof are voluntary or involuntary.

In the other *Tabes Dorsalis* above-mentioned, not the seed it self, but an ichor or a certain putrilage is cast out abundantly from the genital parts; the efflux whereof, if it be great and continual, doth frequently impair the strength of the whole body, and by withdrawing and prodigally removing the nutritive matter, it induces an Atrophy or consumption. For near the spermatic Vessels, or in passage from them, as well in men as women, there are certain Emunctories placed, whose faculty is to receive the superfluous humour from the seed formed, and when it abounds to send it abroad through the genital parts. For this cause that those passages in either Sex may be made slippery and moist (lest they grow dry, and become less sensible) the Prostates in men and the Glandules about the horns of the womb in women are constituted; out of both which always in the act of coition, and sometimes without, when the spermatic bodies abound with too much moisture, a certain serous liquor sweats out: and in women (whose bodies are more moist, and in whom Nature hath made these ways for their menstrual excretion) this doth oftner and more plentifully happen than to men. But if these Emunctories be affected with a great debility, or a certain virulency, so that they corrupt this liquor sent, or do not retain it enough, it is not only sent away incessantly, and flows out plentifully through the *Pudendum*, but also other superfluous humours or recrements of the whole body flowing together to those weak parts are thrown forth together. Also the nutritious Juice destined to the neighbouring parts flows thither, and presently goes out together; so that at length by reason of the loss of the nutritious Juice (which flowing to the same place is corrupted and continually sent away) not only pains of the neighbouring parts, but of the whole body, and a pining doth succeed. These things are commonly known in a Gonorrhœa, also in *fluore muliebri*, or those affects from an impure bed, or immoderate Venery, or are caused by a blow, a bruise, violent exercise, or any other hurt inflicted upon the Loins. It is not proper to this place to deliver particularly the true rendring of the cause and curatory method of healing of this sort of passions: we shall proceed to treat of a *Phthisis* or *Tabes* properly so called, *viz.* which arises from the only or chief fault of the Lungs, which was the business of our design.

2. Or Ichor flowing into those parts from solution of continuity.

The formal reason of a virulent Gonorrhœa.

SECT. I. CHAP. VI.

Of a Phthisis properly so called, or of a Consumption arising by fault of the Lungs.

A Consumption doth so frequently and usually proceed from the Lungs being depraved, that some have termed it the peculiar Disease of this Bowel: and that it very often so comes to pass, the reason is; because (as we have shewed before) the pining of the body doth for the most part more immediately proceed from the blood depraved and unapt for nourishment, it is manifest, that as its perfection is acquired in the Lungs, so from these being ill-affected the same is most of all vitiated, and degenerates into a languishing and corruptible state. For in the Lungs rather than in the Heart or Brain, the threads of life are spun, and there they are oftneft defiled or broken.

A Phthisis is usually defined to be A pining away of the whole body, taking its rise from an Ulcer in the Lungs. But less true: because I have opened the dead bodies of many that have died of this disease, in whom the Lungs were free from any Ulcer, yet they were set about with little swellings, or stones, or sandy matter throughout the whole: for from thence the blood, because it could neither be freely circulated in the *Præcordium*, nor animated enough by the nitrous air, and when in the mean time it is perpetu-

The definition of a Phthisis.

perpetually polluted by its proper dregs deposited in the Lungs, is frequently vitiated and made incapable of nourishing thereby : wherefore a *Phthisis* is better defined, that it is a withering away of the whole body arising from an ill formation of the Lungs.

The cause assigned by the Ancients.

What the consumptive matter is.

By what ways it enters the Lungs.

Sometimes by the Trachea, yet not destilling from the head.

But sweating out of the sides of the Trachea.

The consumptive matter brought into the Lungs faster by the pneumonic Arteries.

The Ancients following *Hippocrates*, for the most part have assigned only two causes of this disease, viz. a *Catarrh*, and the breaking of a Vein, to which some have added an *Empyema* : and others exclude a *Catarrh* from this number : for what is vulgarly affirmed, that slegm falling from the Head into the Lungs, and abiding there putrifies, is most commonly the cause of a *Phthisis*, or is often brought by it, we have formerly intimated to be altogether erroneous, and shall presently shew it more clearly. In the mean time to shew what the matter is that generates a Consumption as often as it arises without an *Empyema* or *Hæmoptoe* going before, it must be considered after how many manners and by what ways any thing disagreeable or heterogene can enter into the Lungs ; which diligent search being made, it will easily appear, that any thing that is an enemy to the Lungs creeps in and is admitted chiefly either by the *Trachea* or by the pneumonic Arteries, yea and sometimes haply by the Nerves, but nothing by the Veins or Lymphæducts, whose function is only to carry back or away the blood or Lympha, and to leave there nothing at all.

As to the *Trachea*, it is manifest it is ordained for this end, that by its passages or pipes the air might be conveyed in or presently carried back by a constant recourse from whence it comes ; moreover, whether any matter being hurtful or mortal to the *Precordia* may be admitted the same way, shall be now our present disquisition. And that the Lungs frequently incur a pernicious pollution by this entrance is clear from hence, because the moist air of some regions, repleat with fumes, or abounding with malignant vapours, doth frequently induce the consumptive inclination ; nevertheless the affection thereof is wont to be communicated only by aerial minute particles (whereby either the temperament of the blood or the conformation of the Lungs or both are prejudiced.) But whether besides this a ferous matter or some humor corrupting the Lungs doth enter them through this passage, is not without reason doubted : although many do determine a *Catarrh* or a destillation of the Serum from the Brain into the Lungs by the passages of the *Trachea*, the principal cause of a *Phthisis*. Which opinion being erroneously delivered by the Ancients, I admire any either of our modern Physicians or Philosophers have admitted thereof ; for it is manifest by anatomical observations, that nothing from the Brain by the *Glandula pituitaria* (which seems the only passage from thence) falls down into the Palate or Breast, but that the Serum there deposited is conveyed by appropriate passages to the jugular Veins, and is remanded to the blood. Moreover it is manifest to sight, that whatsoever relique of Serum is laid aside in the Glandules of the Ears, Mouth, Nose, or Face, is conveyed from them all by peculiar passages, insomuch that no humor whatsoever destils from the Brain or the Palate into the Lungs.

But although matter exciting a Cough doth not destil from the Head by the *Trachea* into the Lungs, yet sometimes falling down from the sides of the *Trachea* into their cavities, it produces that disease commonly called a *Catarrh*. For the *Aspera Arteria*, like the Arteries bringing blood, are endued with a nervous and musculous Coat, and so do occasionally enjoy sense and motion, having also a glandulous Coat and full of little vessels to sustain the vital heat and nourishment. These last Coats make those interspaces, and as it were cover the Cartilages. Moreover the superfluous serosities proceeding from the blood watering the *Trachea* are deposited into this glandulous Coat, which for the most part presently sweating into the cavities of the *Trachea*, serves chiefly to make them slippery and moist : but if the mass of blood be poured out too much, and precipitated into serosities (as it frequently happens, a cold being taken, or the swallowing down of acid things, and on many other occasions) for this cause a great plenty of watry matter sweats out of the Glandules of the *Trachea* and mouths of the little Arteries into its cavities, which soon doth cause a most troublesom Cough, and often much spittle (which afterwards comes to be consumptive.)

But surely this cause of Spittle and as it were a *Catarrhal* Cough very rarely comes alone, because while the blood watering the *Trachea* having suffered solution, throws in its serosities into the Glandules (whence presently they sweat into its cavities) and also the remaining blood being in like sort dissolved, it insinuates its Serum set apart within the pneumonic arteries, partly into the tracheal hollownesses, and partly into the Lymphæducts, by the overflowing whereof the Lungs are as it were

were overwhelmed and much incited, for the most part provok'd to Cough and continual spitting. A Cough and spitting of this kind as long as moderate, only throwing off the serosities of the blood, rather are beneficial than prejudicial; because the mafs of blood, and the very lungs being thoroughly purged after this sort, those symptoms for the most part spontaneously abate, and from thence ensues a more perfect health. But if they be protracted a long time, the serous humour being on both sides laid aside into the tracheal passages, and from thence more plentifully daily heapt up, at length it will change into corruption; because as well the free enjoyment of air is impeded, as also the motion of the blood, and its temperature wholly perverted; from hence a Cough becomes more fierce, and breathing more difficult; nay rather the whole mafs of blood in as much as it is defiled by the foul blood (which the Veins receive from the Lungs) degenerating by degrees from its benign properties, and being depraved, it not only continually pours forth the superfluous Serum, but also the nutritive Juice (which it cannot assimilate) out of the pneumonic Arteries into the tracheal passages; and so this mafs of consumptive matter is daily increased, till the Lungs being more and more obstructed and filled, and the blood being defiled, and rendered unfit to perform any of its functions, the Cough and Spittle become worse and worse, and presently become dangerous; Moreover breathing being hurt, the faintness and pining away of the whole body, the debility of all the functions, and at length a hectic fever, and a hasty declination to death follows.

A Cough and spitting sometimes healthful.

Yet often being too much is dangerous.

When by the long continuance of a Cough and Spitting, leasurably encreasing, the humour is more plentifully deposited out of the mafs of blood into the lungs, it first of all enters into the tracheal little bladders, and at length fills them, and somewhat distends them, from which while every morning by expectoration then more copiously performed, it is almost entirely cast out from them, thence the Thorax is exempt for a short space from the burden, and respiration seems more free: yet a little afterwards the blood being stuff'd again with Serum or nutritive juice, it pours down new matter into the lungs; and from thence again after meat or sleep the little bladders are fill'd, and the humours by the afflux daily encreased, are more distended and enlarged, and at length the sides of two or more of the little bladders, being burst, many little bladders are here and there framed as it were into one lake, within which the consumptive matter being more abundantly collected, there it putrifies (for it is not entirely presently cast out) and from thence it corrupts the substance of the lungs, to which it is joined, and imparts a putrid defilement to the blood passing through it. This breach thus made in the lungs is daily encreased, and frequently more are at the same time formed in divers places, and by reason of the great plenty of humours heaped up and putrified in them, a heaviness of the breast is felt, like a weighty burden upon them, the breathing is more hindred; moreover from the tabid blood being more plentifully intermix'd with the mafs of blood, frequent effervescences of it, destruction of the nutritive juice, also thirst, heat, loss of appetite, nightly sweats, and a pining of the whole body do arise. But the blood being polluted from the lungs, causes them to be punished with a reciprocal affection, that is to say from its peculiar pollution; because the blood in the veins receiving this purulent matter in every circuit, it immediately delivers it into the arterial; from whence, whereas it cannot be sent enough away by sweat, or by Urine, it is brought back by the pneumonic arteries to the lungs, where again being separated from the blood, it is every where conveyed as well into the little bladders of the Trachea as into the lesser passages; insomuch, that at length the whole frame of the lungs being filled, clefts or ulcers are formed consequently in many places, and all the other hollownesses are stufft with frothy quitter.

Why the Consumptive matter affects, and by degrees hurts the lungs.

How an Ulcer of the Lungs is made.

But sometimes it happens that there is one Ulcer or hole, or happily two formed in the Lungs, and the sides grow callous round about, so that the matter being there gathered together is not conveyed into the mafs of blood, but is daily expectorated though in a vast plenty. They that are so affected, as if they had but an illue in the lungs, although they cast up much Spittle, and thick and yellow matter every morning, and a little sometimes all day, yet otherwise they live well enough in health, they breathe, eat and sleep well, are well in flesh, or at least remain in an indifferent habit of body, and frequently arrive to old age: insomuch that some are said to have been consumptive thirty or forty years, and to have prolonged the disease even unto the term of their life (for that cause not being shortened). And in the mean time others who cough or spit less, within a few months fall into a hectic fever, and in a short while are hurried into their grave.

An ulcer of the lungs covered with a callus less prejudicial.

Hither:

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*The ill temper
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Hitherto touching the conjunct cause and formal reason of a Phthisis or pulmonary Consumption; what belongs to the other causes (that is to say, procatactic and evident ones) they truly are various and manifold, inasmuch namely as they are more near or more remote, inward or outward, and lastly connatural or adventitious: That I may undertake to design the powers, operations, and modes of effecting of all these in producing a Phthisis; primarily it is requisite that I shew, by how many modes, and by reason of what occasions the serous humour or (as folks commonly say) the Catarrhal, is laid apart out of the mass of blood into the little bladders of the lungs, and into other passages of the Trachea. Upon diligent search of this it is obvious to any one to perceive the morbid cause consists of two parts, and that the fault is in the ill temper of the blood sending an offending matter to the *Thorax*, and also the weakness or ill tone of the lungs easily receiving it.

As to the former, it is manifest enough by common observation, that the mass of blood being stult with incongruous particles, viz. its proper ones degenerated, or with others from other places intermingled, doth boyl up for the expurging of them, and what is to be separated, when it is not easily sent away by any other ways, it is spread abroad into the lungs, (if they are of a weaker constitution) and cleaves to them.

There are many dyscracies of the blood, and those of divers kinds and affections, by which its liquor being dissolv'd in its consistence, and as it were curdled, doth not rightly contain the serous and nutritive juice within it self; moreover sending away these and other excrementitious humours uncessantly from it self, as sometimes it deposits them among other parts, so more often into the lungs.

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2. The nervous juice being frequently degenerated, and with an abundant lymph returning back out of the fibres and nervous parts into the blood, as it produces ill affects of the bowels, and of the reins (whereof in another place we have hinted) so sometimes it causes a fierce and very troublesome Cough. This kind of Cough one while is Catarrhal, inasmuch as the Lymph having pass'd through the mass of blood, is deposited in the Lungs by the arteries; another while it is convulsive, inasmuch as the Nerves and fibres, constituted to move the breast, are possess'd by that liquor, and are provok'd into convulsive motions: from either cause either conjunct or separately it comes to pass, that more grievous passions of the brain and nervous kind frequently call on a troublesome Cough, or are wholly changed into it.

3. Besides the faults of the blood and nervous juice, frequently exciting a Cough, it is probable that it sometimes arises from the Lympheducts being obstructed, which belong unto the Lungs: for whereas very many Vessels of this kind are spread abroad through the Lungs, whose function it is to receive whatsoever is superfluous of the Lymph that is carryed through the Arteries into the *Præcordia*, and not immediately brought back by the veins, and to convey it to the trunk of the passage of the *Thorax*; if by chance it happens that these passages are stop't or obstructed by viscous matter, or compress'd or thickned by cold should not well discharge their duty, it must needs be that those watery excrements shut out from their wonted flues, or whirling back into the blood, do incite its fierce boyling up, or being pour'd into the passages of the Trachea, do stir up a Cough.

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4. Neither do the humors above-mentioned only, in as much as they either pervert or hinder the crâsis or motion of the blood, induce a Cough (which frequently is the beginning of a Phthisis;) but moreover any usual or wonted Evacuations suppressed, or let, do usually impress a fault upon the Lungs. The menstuous flux or the Hæmorrhoids obstructed, often bleeding at the Nose it by chance it ceases, Issues closed up, Pustles, Scabs and Wheals driven back, do frequently affix a taint in the *Thorax*. If a plentiful Spitting from the Glandules of the Mouth stops of its own accord, or be cured by Medicine, afterwards sometimes a consumptive Cough succeeds; wherefore the same is vulgarly called a Rheum, which had lately fallen from the Head into the Jaws and Throat, and thence distilled deeper into the Lungs; when indeed it is nothing else but a certain superfluous serosity of blood, that being used to be put aside by the cephalic Arteries into the Glandules of the Mouth, now being excluded thence, is hurried through the pneumonic Arteries into the Lungs.

The fourth reason is usual evacuations suppressed.

Besides these private and periodical, or extraordinary Evacuations, whose suppressions incline to a Cough and Phthisis, there occurs another general and constant Evacuation, *viz.* insensible transpiration; which being either stopt or suppressed, is oftner the occasion or parent of that evil than all the rest. For the steams that usually evaporate by the Pores of the skin being restrained within, ferment the blood, and soon pervert it, and cause it to be precipitated into serosities; which with other excrements of the mass of blood being immediately laid aside in the Lungs, do stir up a troublesome Cough and often a consumptive one. Hence it is a common observation, that the catching of a cold, by which the Pores are stopt, whether it be by the blowing of cold air, or being wet by rain, or leaving off cloaths, or by what other means it may come to pass, disposes very many to distempers of the *Thorax*. Wherefore in our Idiom the cause being put for the effect, a Cough is called *Catching of cold*.

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These are the chief causes and occasions which occur from the blood any ways depraved, and therefore depositing a peccant matter into the Lungs. There follow other causes in regard of the Lung it self, *viz.* those which dispose this Bowel more readily to a Cough or a Phthisis, of which there are three sorts. 1. An ill frame of the Breast. 2. An innate weakness of the Lungs, or hereditary disposition to a Consumption. 3. Preceding diseases of the *Thorax*, as a Wound, a Blow, a Pleurisie, a Peripneumony, Empyema, Spitting of blood, the small Pox and Measles, &c. 4. The incongruity of air which is inspired (as deserving a place among the procatastic causes.) By reason of any one of these causes, and sometimes of many together, the matter provoking a Cough, proving often after consumptive, doth easily assault the Lungs, and enters them, and frequently imprints a deadly hurt. On each of these we shall insist a little.

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From the breast ill formed.

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First therefore as to the frame of the Breast the case stands thus: *viz.* that the Lungs being still whole and sound, and free from any phthisical impression, may be kept for a long time in their office, it will behove that they still be exercised with a motion that is vigorous, and with stretched out sails as it were to discharge the strong interchanges of the Systole and Diastole; to that end, that the air being plentifully sucked in, may be admitted to their inmost apartments, and from thence immediately be cast back for the most part together with all the effluvia and sooty vapours at every change of breath. Wherefore since the action of the Lungs doth depend much on the frame of the *Thorax*, as being the moving Engine, it must needs be, that by reason of its ill fashioning, the function of breathing becomes defective in many things. There are two special kinds of a Breast ill framed, (*viz.* crookedness, and shoulders like wings) for which reason many are found prone to a Phthisis: the reason of which is, that in any such figure of the breast, being either depressed or made long, the Lungs do neither enjoy a space so free and ample, nor can the moving Muscles be so strongly contracted as in a square breast.

The reason of the former exposed.

2. The innate debility or hereditary disposition of the Lungs to a Consumption is so frequent and vulgarly known, that when any is found inclining to a Consumption, he is presently questioned, whether his parents were not obnoxious to this distemper? Very many of these being endued with a narrow breast and a neck somewhat long, and of a constitution very tender, contract a Cough from the least occasion; neither can they endure a cold or moist air. To some of these a mansion in a City is very prejudicial, where the air is breathed in thick and smoaky; on the contrary, to others prone unto the same disposition it is very friendly (the reason whereof we shall diligently inquire hereafter) To all of them a North-wind is for the most part an enemy, considering that it usually irritates a Cough, also a Spitting of blood, a Pleurisie, or Peripneumony,

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mony, *viz.* the pneumonic or the thoracical Vessels being thereby stufft, and in the mean time the blood being rendred more turgid and sharp, by reason of transpiration hindred, and the effluvia's restrained within the mass thereof.

In what it consists.

For an hereditary disposition to a Phthisis doth chiefly consist in these two things: *viz.* 1. In regard the Patients being endued with a more sharp and elastic blood, do require a more plentiful transpiration; which perhaps if it be less granted, the matter that was wont to evaporate redounds upon the infirm Lungs. 2. If the pneumonic Vessels be too loose and tender, they do not duly contain the Serum and other recrements of blood within the dissolved mass thereof, but they sometimes suffer both them and a certain portion of the blood it self to break out into the Tracheal passages: whose moving Fibres, when they are infirm, do not presently turn forth what is poured out into the cavities; but they suffer it to abide and putrifie in the same place, and at length to degenerate into black filthy gore corruptive both of the Lungs and blood.

What the consumptive diseases of the breast are.

3. A Phthisis is sometimes the product or consequent of some other previous distempers of the Breast. Those consumptive passions chiefly are Empyema's, Pleurifies, a Peripneumony, and Imposthume of the Lungs; and sometimes the small Pox, Measles: also irregular Feavers ill or slightly judged, do cause the same effect. The chief of these distempers, or at least those which are proper to the *Thorax*, together with the rendering the reason of the causes, and how they dispose to a Consumption, shall be declared hereafter, with the reasons and manner of procedure; in the mean time we are to take notice, that this kind of fault is common to them all, that is to say, they dissolve the unity and weaken the tone of the Lungs, and pervert the temperature of the blood; whence whatsoever incongruous or distempered thing is poured out upon them from its depraved mass, they do easily admit thereof, and difficultly or not at all drive it back.

The influence of the air for exciting a Consumption.

4. The procatactic causes of a Phthisis being now explained, *viz.* those which consist as well from the blood as the Lungs, there is another common to them both, which may be justly added, and (although altogether extrinsic) hath great affinity with them both, *viz.* the condition or temper of the air breathed in. For such is the influence hereof to some consumptive persons, that the cause of the disease is sometimes wholly ascribed to the incongruity of the air wherein they dwell, and for a cure the alteration of air or soil is preferred to all other remedies whatsoever. Hence many of our Country troubled with a Cough, or being in a Consumption, flock to the Southern parts of *France*; and others in the mean time who cannot go beyond Sea, or will not, presently hasten to remove out of the City-smoke into the Country as to a most undoubted refuge: wherefore all our Villages near *London*, which enjoy a clear and open air, are esteemed as so many Spittles for consumptive persons. Notwithstanding all do not alike receive help from such a change of places; for many either passing to *France* or to Country Villages, do in those places rather find their graves than health. And therefore *London* is not presently to be forsaken by all phthical persons: for I have known many obnoxious to a Cough or Consumption to have enjoyed their health much better in this smoaky air than in the Country. So that for cure of the same disease, while some avoid this City as Hell, others flye to it as to an *Asylum*.

The grosser and City-air to some consumptive persons healthful, to others hurtful.

The reason whereof is inquired.

The reasons of these things do clearly appear out of the Doctrine of Breathing before handled; for we do demonstrate the blood passing through the Lungs, both as to its kindling or vitality, and as to its motion doth chiefly depend on nitrous air sucked in; whence it is a consequence, that the tenor of this ought to be so proportioned to the temperament of that, that the blood being moderately kindled within the *Præcordia*, may burn out clearly and vigorously, as well without smoak and footinefs as without too intense a flame, and that it may pass the pneumonic Vessels freely, and without any hindrance or leaving of recrements. Wherefore a moist, fenny, and close air, as it is healthful to none, so to them that cough it is especially hurtful; on the contrary, a serene and mild air, moderately enjoying the Sun and wind, as it is healthful to all persons, so it is friendly to all consumptive persons. As to other conditions of the air, some escape a Cough, or lose it living in mountainous places exposed to the Sun, where the impendent Atmosphere being free from all thick, smoaky, and feculent vapours whatsoever, abounds with nitrous particles: for those whose thick and feculent blood abounds with an impure Sulphur, to kindle this duly and to waste the dregginess, there is need of a very thin and nitrous air. If the Lungs be not too tender, but firm and strong, they endure the more fierce assaults of its particles; on the other side, they who have a thin and subtil blood, easily dissolvable and endued with a more pure

pure but very little Sulphur, and having tender and soft lungs, very sensible, and of a finer texture; these persons being impatient of a nitrous and sharper air, are most at ease and best in a thick and more sulphureous one. Wherefore it conduces to these persons, that they breathe the gross and more fat air of a smoaky City; which to an impoverished and more thin blood, doth afford Sulphur (which fails sometimes) and also Nitre, and doth something thicken and fix its subtile consistence; moreover it dulls the substance or texture of a Lung too much sensible and more thin, and is a defence against the invasions of a more sharp and impropportionate Air. It is manifest by frequent experience, that a thicker Air, provided it be sulphureous, proves very benign to some phthical persons (that I do not say to all.) It is a common observation, that a Consumption seldom infests those Regions either in *England* or *Holland*, where fires are nourished by turf, and do breathe a very sulphureous odour, yea rather those places are chiefly wholesom and frequently sanative to persons obnoxious to a Phthisis, or labouring under it. To which we may add, that a suffumigation of Sulphur and Arsenic (which is filled with much Sulphur) is reputed for the curing of almost incurable Ulcers of the Lungs, although the last, yet the most efficacious remedy. Moreover add to this, that pectoral Medicines prepared of Sulphur are far to be preferred to any other; so that Sulphur is justly reported by Chymists to be the Balsam of the Lungs. By what order and by what means these Medicines do work, and so notably help in diseases of the *Thorax*, we shall hereafter make diligent search into: in the mean time that sulphureous Air is found helpful to certain phthical persons, the reason consists in these two things; viz. in the first place, as we now intimated, from such an Air sucked in there is help brought to the jejune and depauperated blood and to the tender Lungs. Secondly, that the sulphureous Particles being sucked in with the nitrous, do provide against, or take away the acidities of any of the humours (by which their flowings and extravasations into the Lungs do chiefly arise.) And for this reason it is that sulphureous Medicines, being also taken inwardly, do confer so excellent a help to them that cough or are phthical: and therefore Sulphur, as I now hinted, hath the report of being the Balsam of the Lungs. For as balsamic things applied to an Ulcer or Wound extinguish the acidity of the Ichor there sweating out and corrupting and paining the little Fibres, soon ease the pain, and afterwards heal the wound; so also the sulphureous Particles, passed into the Lungs either with the air or with the blood, in as much as they provide against or abolish the acidities of all humours, i. e. the blood, the Serum, the Lympha, the nervous or nutritive Juice, they conduce to the prevention or cure of a Consumption. We shall in what follows more at large declare the cause, when sulphureous Medicines shall be particularly treated of.

A sulphureous air healthful to some consumptives.

Sulphureous Medicines chiefly agreeing.

The reason thereof discovered.

The conjunct and procatactic causes of a Phthisis being thus handled, it will not be necessary to discourse much touching the evident causes. For in what manner a closing of the Pores by cold, a surfeit or tipling, and other errors of several sorts, in the six non-naturals, dispose to those distempers, and sometimes presently do bring them, is so clear, that it needs no explaining. Neither is there any reason we should be long delayed about the Semiotal part of this disease; nevertheless it is fit we observe the divers states or distinctive signs which certainly belong unto it. 1. When it is merely a Cough. 2. When it begins to degenerate into a Phthisis. 3. When it is a perfect and almost desperate Phthisis. From which things duly designed, the Prognostic of the above-mentioned affections will be very apparent.

The three times or distinct states of a Cough.

1. And in the first place what belongs to a new Cough, and as yet alone, this taking its rise from any cause whatsoever in bodies predisposed to a Phthisis, will scarce ever be free from the suspicion of danger; but in a strong man, and one who hath often before endured a Cough Scot-free, it will not be immediately to be feared: for when being stirred up from a more forcible evident cause, without Feaver or indisposition of the whole body, it shall not be very troublesome, then it merely passes for a cold being taken, and is altogether neglected, or in a short time is wont to be finished without many or very considerable Remedies. Moreover if a small Feaver with thirst and want of appetite accompany this, there is hope that the blood being restored to its due temperament, the Cough then will cease of its own accord: but if it be protracted longer, and not easily yield to vulgar Remedies, and produces much spitting, and that discoloured, it must not be any longer neglected, but be provided against by a method of healing, and by fit remedies and an exact course of diet. For then it may well be suspected, that the Lungs being prejudiced in their structure, do not circulate the blood entirely, but let fall the Serum and Lympha, and frequently

When new, there is no suspicion of a Consumption.

frequently the nutritive Juice; and moreover those humors so laid aside do putrifie; and from thence the blood is defiled, which by a reciprocal hurt prejudices again the Lungs.

*When it begins
to induce a Con-
sumption.*

2. But if to a Cough growing daily worse and worse with plentiful and thick spittle, a languishing and pining of the whole body, loss of appetite, difficult breathing, thirst, and fervent heat of the blood be added, there is great cause of suspicion that it is come at least to the first limits of a Phthisis (if not further.) Wherefore it will behove us to use all means, whereby the Lungs may be freed from the great quantity of matter heaped up together, and be defended from its continual assault or invasion; and also that the mass of blood may be cleansed from all dregs, and restored to its due temperament whereby it may rightly contain its serosities and other humors within it self, or transfer them to some other place than to the Lungs.

*When it becomes
a confirmed Con-
sumption.*

3. But if, beyond the state of this distemper now described, plenty of spittle, and that discoloured, shall be daily increased, and all other things growing worse and worse, a dejection of the whole strength, and a hectic Fever with a continual thirst, night Sweats, an Hippocratical face, an utter decay of the flesh almost to the driness of a Skeleton, happen upon all these, then for the most part no place is left for Medicine, but only a dreadful prognostic; at least all hope of Cure being waved, we must insist upon Anodynes, whereby an easie death may be procured.

*The curing me-
thod, and first
against a begin-
ning Cough.*

What therefore belongs to the cure of a Cough in general, according to the three above-mentioned states of this disease, a threefold method of healing ought to be appointed, viz. that bounds as it were being set, we may more distinctly prescribe what is to be done for the cure of a Cough, whilst being on this side the limits of a Phthisis, it passes only for a cold caught. 2. What manner of healing to a beginning Phthisis. 3. What to a Phthisis consummated, or desperate.

*Three indica-
tions.*

1. Although against a new Cough for the most part there are used only Remedies Empirical, and scarce any of the common people but are furnished with many and divers of this sort, which every where without the advice of a Physician very many confidently take, and without method, and give them to others: yet men of a delicate constitution, or inclining to a Consumption hereditarily, or sometimes formerly in hazard from a Cough, ought immediately to provide against the first assaults thereof, and readily betake themselves to the Precepts of Physick; according to which, that the method of healing may be duly instituted, the curatory indications shall be chiefly these three; viz. 1. To appease or take off the disorder of the blood, from whence the fluxes of the Serum do proceed. 2. To derive the excrements of the blood and all exuvia, apt to separate from it, from the Lungs to the Pores of the skin, or to the urinary passages, and into the other Emunctories. 3. To strengthen the Lungs themselves against the reception of the Serum and other humors, and also to defend them against the invasion of outward cold, whereby they are wont to receive further hurt. Upon each of these we shall treat a little more plainly.

*The first respects
the effluence
of the blood.*

1. The first indication respects as well the boiling up of the blood, wherein by reason of the effluvia's restrained, it grows too fervently hot, and boils in the vessels; as its dissolution, whereby being solved in its consistence, it lets go too much Serum and other humors from its embraces. For the taking away of both, a thin diet must be appointed, and, the injury from outward cold carefully declined, a little more sweating ought to be procured, or at least the accustomed restored. To this end let the Patient put on thick garments, and let him keep his bed or chamber, at least let him hardly go out of his house, evening and morning let a small breathing Sweat be provoked by Posset-drink boiled with Rosemary or Sage. If notwithstanding all this the Cough increases, Phlebotomy, if the strength and constitution will bear it, is often used with success: after which Hypnoticks for the most part help, in as much as they retard the motion of the heart and consequently the too precipitate course of blood: moreover they cause it to circulate in the pneumatic Vessels gently and mildly without any great throwing out its serosities, and to send away what is superfluous either by Sweat or Urine. To this purpose pectoral Decoctions are also to be administered, in as much as they destroy the acidity of humors, and hinder the dissolution of the blood, and its melting into serosities. By the like reason and manner, Medicines prepared of Sulphur do so signally help against a Cough.

*The second re-
spects the deri-
vation of the
Serum and other
excrements from
the Lungs.*

The second indication, viz. that the Serum and other recrements of the blood, derived from the Lungs, may be evacuated by other ways, is performed by Diaphoretics, Diuretics, and mild Purgers; which ought to be mixed with other Remedies,

OF

or now and then used alone. Wherefore after Phlebotomy we use to prescribe a gentle Purge, and sometimes to repeat it. Among the Ingredients of the pectoral Decoction let the Root of Chervile, Butchers-broom, Elicampagne, and other things that provoke Sweat and Urine be put. Hog-lice, volatile Salt of Amber, and other fixed Salts and Powders of Shells made into Pills with Turpentine are often given with success.

The third indication, that the Lungs and their passages might be defended against the flowing of humors, the encountering of cold, and the suppression of the Catarrh, as they commonly call it, is performed by Linctus's, Lohochs, and other private Remedies, and chiefly respects two things; viz. that the mouths of the Vessels and Glands opening into the Trachea be shut with moderate Astringents, lest they should too much cast out the serosities into it: and secondly, that the sides of the Tracheal passages may be made smooth and glib, that neither from the pouring out of the sharp Serum, nor invasion of any outward cold they may be offended, and continually provoked into a troublesome Cough; and moreover when those passages are made slippery enough, the spittle sometimes obstinately cleaving to their sides, might be the more easily coughed out. For the first intention it is, that Conserve of red Roses, Olibanum, Mastich, Lohoch of Pine-tree, Syrup of Jujubes, of dried Roses, of Cup-moss, and other Astringents are often put into the forms of Pectoral Prescriptions. For the second intention Liquorish, with the divers preparations thereof, is reputed a famous Remedy against any Cough: for this purpose Syrups and Lohochs, and all other sweet Pectorals seem to be ordained. To which is added Oyl of sweet Almonds, either administred by it self, or brought with pectoral Syrups after a long stirring of them together into a milk-form liquor.

The third intends the suppressing the Catarrh and strengthening the Lungs.

These are the chief Therapeutic indications, together with the apt intentions of healing, which seem chiefly to be of use for a new Cough, while as yet we have no suspicion of a Phthisis, or at least that it subsists without the manifest limits thereof; it now remains, after this general method briefly shadowed out, that we subjoin certain choice forms of Medicines appropriated to every intention. These, though they are manifold and of divers preparations, yet those which are of chiefest note and most in use, are Mixtures, Linctus's, Lohochs, Tinctures, Balsams, Troches, Lozenges, Powders, Pills, Decoctions, and distilled Waters. Of each of these we shall set down some choice Receipts.

Forms of Medicines which are most in use.

1. Mixtures.

Take of Syrup de Meconio, of Jujubes, of each an ounce and half; of powder of Olibanum a dram, the water of Earth-worms, or of aq. Hysterica, or Peony compound a dram, mingle them. The Dose is one spoonful at bed-time and after midnight.

Take of the water of Snails, of Earth-worms, of each an ounce and half; of the liquid Laudanum Tartarized two drams, Syrup of Violets an ounce. The Dose is one spoonful at bed-time.

Take of Snail-water ℥vj. Syrup of the juice of ground-Ivy, ℥ij. Flower of Brimstone ʒss. mix them. The dose is one spoonfull at bed-time, and soon in the morning.

Take of our Syrup of Sulphur 4 ounces, Water of Earth-worms 1 ounce. Dose 1 spoonfull after the same manner.

2. Linctus's.

Take of Syrup of Jujubes, Maiden-hair of each one ℥ and half, Syrup of red Poppy 1 ounce, mix them, to be lick'd with a Liquorish Stick.

Take Oyl of Sweet-Almonds fresh drawn, Syrup of Maidenhair, of each 1 ounce and half, white Sugar-candy 2 drachms, mix them by beating in a Glasi-mortar, or shaking them in a Glasi Vial till it wax white.

3. Lohochs.

Take Conserve of red Roses 2 ounces and half, Lohoch Sanum 1 ounce and half, Spec. Diatragacanth. frig. 1 dram and half, flowers of Brimstone half a dram, Syrup of Violets or red Poppyes as much as sufficeth, let it be made a soft Lohoch. Dose 1 dram and half at night and early in the morning; at other times to be lick'd with a Liquorish stick.

Take of the powder of the leaves of Hedge-mustard, or Rockets, 1 ounce and half, clarified Honey 4 ounces, mix them for a Lohoch, let it be administred after the same manner. It agrees with cold Constitutions.

4. Tinctures.

4. Tinctures.

Take of Tincture of Sulphur, without empyreuma 3 drams, Dose from 6 drops to ten in the evening, and early in the morning in 1 spoonfull of Syr. of Violets, or of the juice of ground-Ivy; I scarce know a more excellent remedy for any Cough, provided there be no feaver.

Take of Tincture of the Sulphur of Antimony 2 drams, Dose 20 drops evening and morning in one spoonful of the pectoral Syrup.

Take of the Tincture of Gum Ammoniack (prepar'd with the Tincture of Salt of Tartar) 1 ounce, Dose from 15 drops to 20. After the same manner the Tinctures of Galbanum, Asa fetida, Gum of Ivie (prepar'd after the same manner) are proper for a Cough in any cold constitution.

5. Balfams.

Take of Opobalsamum 2 drams, Dose from 6 drops to ten in a spoonfull or two of Hyssop, or Penny-royal, or any other Pectoral water.

Take of the Balsam artificially distill'd, commonly call'd the Mater Balsami, two drams, Dose from 6 drops to ten in one spoonfull of Syrup of Violets or Canary Wine evening and morning.

Take Balsam of Sulphur two drams, the dose from five drops to ten after the same manner.

Take of Balsam of Peru one dram, Dose from two drops to 4 or 6 in Conserve of Violets.

6. Troches.

Take of the Species of Diatragacanth. frigid. ℥ss. Liquorish ʒj. flower of Sulphur ʒij. flower of Benzoin ʒj. Sugar Penids ʒiij. make a Paste with the dissolution of Gum Tragacanth in Hyssop-water, form it into troches of the weight of ʒss. Take one often in the day or in the night.

Take of the seeds of white Poppies ʒvj. of the powder of the flowers of red Poppies ʒj. extract of Liquorish ʒij. milk of Sulphur ʒss. Sugar Penids ʒij. with mucilage of Quince-seeds make a Paste, and form it into troches.

Take of the Species Diaireos, of the lung of a Fox, of each ʒss. Sugar Penids ʒij. with the dissolution of Gum Tragacanth, make them into Troches.

Take of powder of Elicampane, Anniseeds, Liquorish, of each ʒij. flower of Brimstone ʒj. of Tablet Sugar ʒiij. juice of Liquorish dissolv'd, as much as will suffice, make Troches.

7. Lozenges.

Take of the Species Diatragacanth. frigid. ʒiij. powder of the flowers of red Poppies, milk of Sulphur, of each ʒss. of Sugar dissolv'd in Poppy-water, and boyl'd to make Tablets, ʒiij. form lozenges of ʒss. weight.

Take of Species Diaireos, of the lung of a Fox, of each ʒiij. flower of Brimstone, powder of Elicampane of each ʒss. of the whitest Benzoin ʒj. make them in a fine powder, adding of Oyl of Anniseeds ʒj. Sugar dissolved, and boyled to a height to make lozenges ʒviij. for lozenges of ʒss. weight.

8. Powders.

These though more seldom, yet are sometimes given with success in a Cough, and pneumatic distempers.

Take of the tops of Ground-Ivy somewhat reddish, a sufficient quantity, bruised let them be form'd into a Cake, which dried presently in the hot Sun, reduce into fine powder, and keep it in a glass. This Plant keeps its virtue with smell and taste longer than any either Conserves or Syrups, and greatly profits in a grievous and pertinacious cough. Take from ʒss. to a dram, in distill'd water, or pectoral decoction twice in a day.

After

After the same manner Powders of other pectoral Plants are prepared, and taken with benefit.

Take of Cup-moss or chin-cups ℥iij. milk of Sulphur ℥j. Sugar-candy ℥ss. make a powder; the dose from ℥j. to ℥ss. twice in a day. This powder is given with great benefit to those labouring with a chin-cough.

Take of the flour of Brimstone, Olibanum, Ceruse of Antimony, of each ℥ij. divide it into xii. parts, take one part in the morning, and another in the evening in a spoonfull of a convenient vehicle.

9. Pills.

Take of Aloes rosata, or rather of Ruffus's his Pill, flower of Brimstone of each one dram and half, flowers of Benzoin ℥j. Juice of Liquorish dissolv'd in as much Snail-water as will suffice to make a mass, form it into small pills to be taken 4 at night, to be repeated every or every other night.

Take of powder of Elecampane, Liquorish, flower of Brimstone, of each one dram, flowers of Benzoin half a dram, Tarr as much as is sufficient, form it into small pills, the Dose 3 or 4, evening or soon in the morning.

Take of Millepedes or Hogs-lice prepared ℥ij. the powder of the seeds of Nettles, Burdock of each half a dram, Oyl of Nutmegs distilled ℥j. Salt of Amber half a dram, Juice of Liquorish what will suffice, form it into small Pills; take three in the morning and in the evening.

10. Decoctions.

These are taken either by themselves, or with the addition of Milk. Among those which are of the first kind, 1. The Pectoral Decoction according to the London Dispensatory, offers it self. Which is taken twice a day from ℥iij. to vj. or ℥viij.

Take of the leaves of Ground-Ivy, white Maiden-hair, Harts-tongue, Coltsfoot, Agrimony, of each one handfull, Roots of Chervil, Knee-holm, of each one ounce, Carthamus and sweet Fennel seeds, of each half an ounce, boyl them in 6 pints of Spring-water to the consumption of half, adding towards the end Liquorish three drams, Raisins stoned two ounces, Fijubes, ℞ vi. or clarified Honey three ounces, make an Apozeme, clarifying it with the white of an Egge; Dose 6 ounces warm, 2 or 3 times in a day.

Decoctions taken with Milk, are used morning and evening instead of Breakfast and Supper, according to the manner following.

Take the flowers of greater Daisies one handfull, three cleansed Snails, half an ounce of candied Eringo roots, Barly 3 drams, boyl them in a pint and half of water to a pint. Take 6 or 8 ounces warm, adding a little milk; and afterwards the quantity encreased by little and little.

After the same manner, Cup-moss, Ground-Ivy, St. John's-wort, and other pectoral herbs are boyl'd and taken with Milk.

The Decoction of Woods often does conduce much to the cure of a stubborn Cough, especially if appointed in the place of Beer, for ordinary drink, and taken for some time.

Take of the roots of Sarsaparilla 4. ounces, China two ounces, white and red Sanders of each half an ounce, shavings of Ivory and Harts-horn of each 3 drams, let them be infused, and boyled from 8 pints of Conduit-water to 4, adding Liquorish 6 drams, Raisins stoned an ounce and half; in a phlegmatick or colder constitution, adde of shavings of Lignum vitæ.

11. Distilled Waters.

Every one may compound manifold and divers forms of these as occasion requires, and appoint according to the constitution of the patient, sometimes simple Milk, sometimes Milk with some part of Wine, sometimes Ale, or Brunswick Mum. For a Sample we will prescribe the form of these.

Take

Take of the leaves of ground-Ivy, Hyssop, Penny-royal, of each four handfulls, of Snails half-boyl'd in their shells two pounds, Nutmegs sliced no. vj. Upon all being cut small pour eight pints of fresh milk, let it be distilled in the common Organs, i. e. a Pewter-Still:

The dose 3 ounces twice or thrice in a day by it self or with some other Medicine.

Every dose let it be sweetned when it is taken with Sugar-candy, or with the syrup of the juice of Ground-Ivy.

In a constitution less hot, especially if there be no fervent heat of the blood or *Præcordium*, to six or seven pints of Milk, adde one pint or two of Canary wine; and in a phlegmatick or old body, instead of Milk let the *Menstruum* be Ale or *Brunk-wick Beer*, i. e. Mum.

Moreover, in Winter-season when Snails cannot easily or scarcely be procured at all, there may be substituted in their stead Lambs or Sheeps Lungs, also sometimes Calves, being half-boyl'd and cut small, with the forementioned ingredients, and a fit *Menstruum* being added, let them be distilled in common Organs, or Rose-stills.

The convulsive Cough of children call'd the Chin-cough.

To this form, treating of a Cough not yet arrived to a Phthisis, ought to be referred the convulsive or suffocating Cough of children, and in our Idiom called the *Chin-cough*. This assaults chiefly Children and Infants; and at certain seasons, viz. Spring and Autumn especially, is wont to be epidemical. The diseased are taken with frequent and very fierce fits of Coughing, wherein namely the Organs of breathing do not only labour in pain, but also being affected convulsively, they do variously suspend or interrupt their actions; but for the most part the Diaphragma convulsed by it self, or by the impulse of other parts, doth so very long obstinately continue the Systole, or Diastole, that Inspiration, or Expiration being suppress'd for a space, the vital breath can scarcely be drawn; insomuch that coughing as being almost strangled they hoop, and by reason of the blood stagnating, they contract a blackness in their countenance; if perhaps, those organs not in such a measure convulsed, they are able to breathe any thing freer, notwithstanding they are forced always to cough more vehemently and longer, untill they wax faint.

The reason thereof.

The formal reason or conjunct cause of this disease, consists in these two things, viz. that there is present a quick and vehement irritation of the lungs, whereby they are almost continually incited to throw off something troublesome by Cough; and also that the motive parts of the *Thorax*, viz. the Nerves and nervous fibres being predisposed to convulsions, as often as they are irritated, do excite a Cough not regular but convulsive, and such as is opposite or injurious to the usual function of breathing.

The cause partly a Catarrh.

The matter provoking the lungs so frequently into a Cough seems to be the *Serum*, incessantly soaking out of the mass of blood, by reason of its frame being too much loosened, and troubling the parts belonging to the breast, inasmuch as it distills as well through the tracheal arteries into the hollowness of *aspera arteria*, as that it is poured in plentifully through the pneumonic arteries into all the open passages.

A convulsive disposition of the parts of the breast.

The convulsive disposition of the moving parts, as in other convulsive distempers, seems to proceed from a heterogeneous and elastic matter falling from the brain through the nervous passages, together with the nervous liquor, into the small moving fibres of the breast; wherefore, when the spirits that are contained in those little fibres, are stirr'd to perform violent motions of breathing out, they pass into convulsive motions.

The prognostick of this disease.

What relates to the Prognostick of this distemper, this Cough although it be seldom very dangerous or mortal, yet it remains very difficult of cure; and frequently it rather ceases by change of the season than is extinguished by remedies. The cause whereof is, that here not, as in an usual Cough, the blood onely ought to be altered, and its recrements to be derived out of the Lungs, to be conveyed to the habit of the body by sweating, but moreover an amendment of the nervous juice ought to be procured.

Cures first Empirical.

About the curing of this disease, the way of healing used in other kinds of Coughs doth rarely profit here; wherefore old women and Empiricks are oftener consulted than Physicians, and the rational curatory method being postponed and neglected, remedies for the most part onely Empirical are brought into use.

Among the many remedies of this kind, these two following are prefer'd to all others, and chiefly wont to be used; viz. Cup-moss or Chin-moss or Chin-cups, and the various preparations thereof and compositions are taken inwardly, and if there shall

shall be need of any further medicine, that some Bugbear being presented, the Child labouring with it may be cast into a sudden fright. But if the wished success be wanting to administrations of this sort, Ptisans, Syrups, Julips, or Decoctions, and other pectoral helps are rejected, and frequently they desist from all other Medicines, expecting untill the disease either at length of its own accord determine, or be cured by reason of the succeeding change of the year.

1. Chin-cups or Moss is in most common use in our Countrey against the Coughs of Children, and is vulgarly enough known as to its form and manner of growing. It is of an astringent nature (as far as we gather by its taste) and contains in it self particles somewhat sharp and biting, and smelling of plenty of volatile Salt: from whence we may safely conjecture that its use is to fix the blood, and to appease the fluxes of Serum, and moreover by volatilising the nervous juice, to take away the convulsive disposition. It is usually administred in form of Powder, Decoction, and Syrup, according to the following Receipts.

Chin-cups a great remedy.

The reason whereof is inquired.

Take of Chin-cups in powder one dram, Sugar-Candy one scruple, mix them, divide it into three or four parts, take a dose morning and evening with a fit vehicle.

Take of the same Cup-moss two drams, milk of Brimstone two scruples, powder of Anni-seeds one scruple, divide it into six parts to be taken as the former.

Take of the same Chin-moss or cup-moss one dram boyled in milk for one dose; take it morning and evening. To those with whom milk doth not agree, or to whom it little profits, let it be boyled in Spring-water or Hyssop-water, or in any other pectoral water, and let it be given from two ounces to four, twice in a day, sweetning it with Sugar or some fit Syrup.

Take of this Muscus Pyxidatus or chin-moss one ounce, boyl it in two pints of some pectoral water to the consumption of half: To it strained adde of Sugar-Candy one pound, and evaporate it in a gentle bath, to the consistence of a syrup.

2. The other remedy for the convulsive Cough is wont to be, that they be cast into some sudden fright; from hence, whenas medicines effect less, with the vulgar it is a familiar practice, that, to fright them, while a great Mill is driven about with a screeking noise, and a dreadful aspect of the wheels, the distempered be put into the Trough or Receiver of the Grain or Corn, and from thence the sudden cure of this disease sometimes happens. The reason whereof without doubt consists in this, that the Animal spirits being put to flight and forced into fresh distractions, they relinquish their former disorders; moreover, the convulsive matter is either dissipated by that disturbance, or is forced into other nerves where it is less troublesome.

Frights profit in this Cough.

The Empirical cure of this disease being described after this manner, together with the remedies vulgarly used, and the rendring a reason of the cause at least probably unfolded, from hence it will be lawfull to design a rational method of curing, and perhaps more efficacious against childrens Coughs of this kind. Wherefore, in such a case sometimes successfull enough I have prescribed according to the following forms. And seeing we ought to begin with purging,

The rational cure.

Take of the syrup of Peach flowers one spoonfull, of Aqua Hysterica one scruple, mix it, Purging, and let it be taken with government.

Or, take of Mercurius dulcis 6 grains, Scammony prepared with Sulphur, Resine of Jalap, of each three grains; make a powder, give it in a little Pulp of a preserv'd Cherry to a lad six years old, and let the dose be, encreased or lessened according to the age; let the Purge be repeated in 6 or 7 days.

If the Patient (as it often happens) be prone to vomit, Take of Oxytel of Squils 6 drams, Salt of Vitriol 4 grains, mix it for a child of six years old, and according to this proportion let the dose be accommodated to others. I have known a Vomit of this kind taken every morning for four or five dayes together with good success.

Vesicatories or Medicines drawing blisters are in daily use, and are applyed sometimes to the Nucha or nape of the neck, another while behind the ears, then to the inside of the arms near the arm-pits, and as soon as these fores begin to heal in these places, let others be raised in other places.

Vesicatories.

Instead of Beer let the following Decoction be used for ordinary drink.

Mixtures.

Take China-roots an ounce and half, of all the Sanders of each half an ounce, the shavings of Ivory, and Harts-horn of each three drams, let them be infused and boiled in six pints of spring water to the consumption of half, adding Raisins stoned an ounce and half, Liquorish three drams.

Take of Spirit of Gum Ammoniac with Salt Armoriac a dram, Syrup of Chin-moss three ounces, Aq. hysterica an ounce: the dose is a small spoonful in the evening and morning fasting.

Or, Take of tincture of Sulphur two drams, dose three drops in the evening and first in the morning in a spoonful of the Syrup of Cup-moss.

To some endued with a hot constitution, and while they cough their countenance is spread with redness, or rather blackness, I have prescribed Phlebotomy or drawing of blood with Leeches to two or three ounces with good success.

Take Hog-lice living and cleansed two ounces, powder of Aniseed a dram, Nutmeg half a dram, fine Sugar an ounce, bruse them together, and pour upon them six ounces of Hyssop-water, of Magistral Snail-water two ounces, stir them together a little, and press them out hard: the dose two or three spoonfuls twice a day.

Of what sort the beginning of a consumptive cough is.

Three indications concerning its cure.

1. To stop the dissolution of the blood.
2. To draw out the filth from the Lungs.
3. To heal the Lungs hurt.

The first indication suggests three intentions of healing.

The first intention, that the nutritive juice may be proportioned to the blood and assimilated by it.

Hitherto of a Cough and its Remedy, while it is only an entrance to a Consumption; now it remains to treat thoroughly of the distemper it self, having passed the limits of this dangerous disease, and to design a method of curing, and the forms of remedies, which are proper to heal an inveterate Cough, when either being neglected, or not easily giving place to remedies, it begins to degenerate into a Phthisis; namely when it arrives to that state, that the blood being dissolved in its consistence, doth not only pour out the superfluous Serum, but also the nutritive Juice, and perhaps the nervous, the Lympha, and other its superfluities on the Lungs, and lodges them within its passages; and in the mean time the corruption of the Lungs is so much increased, that the little Bladders being distended, or many of them broke into one, so that a solution of continuity or an Ulcer being caused, a greater plenty of corruption is daily heaped in; and moreover the matter in that place gathered together, because it is suffered to abide there long, putrifies, and for that reason doth still more corrupt the Lungs themselves, and defile the blood flowing through. In this case the Therapeutical indications shall be chiefly these three: viz. in the first place to stop the dissolution of the blood, which is the root of all this evil, and to make provision that it pour not out the matter any longer in such abundance upon the Lungs. Secondly, by expectorating the purulent matter heaped up within the Lungs, and to evacuate it quickly and sufficiently. Thirdly, to strengthen and dry the Lungs loosened from their unity, or being too loose or moist or otherwise infirm, lest they be daily more and more corrupted, and give more reception to the morbid matter. Every of these indications suggests various intentions of healing, and requires remedies of divers kinds and many ways of administrations. The chief of which we shall here briefly treat of.

1. Therefore what the first indication suggests, that the dissolution of blood may be prohibited, these three things (as much as may be) ought to be procured: viz. First that the mass of blood may contain and assimilate whatsoever of nutritive juice it may be furnished with; and that it be so proportioned, that it neither offend in quality nor in quantity. Secondly, that the acidities either generated in the blood, or poured into it from some other place, may be so destroyed, that the blood retaining as yet its mixture or temperament, may not be prone to flowings and pourings out. Thirdly and lastly, that all the excrements produced in the blood may be derived from the Lungs to other Emunctories and places of Evacuations.

1. As to the first intention of healing, viz. that the nutritive Juice may be proportioned to the blood, let it be advised before all things, that they who cough and are phthical abstain chiefly from drink; and that they take liquid things in a very small quantity; for that the blood being infirm in its temperament, so long as it is not too much imbued with fresh juice, may be able to digest small portions, and retain it within its own consistence. Moreover, let that fresh juice consist of such kind of particles, which being mild and thin, may be tamed by the blood, and assimilated without any effervescence or heat. Wherefore Asses milk, also sometimes Cows or Goats milk; also Water-gruel, Cream of Barley, Pritan, Almond milks, and other simple nourishments will better agree and nourish more than Flesh, Eggs, and Gelly-broaths,

broaths, strong Ale, Wine, or any other kind of richer fare. Secondly, that the blood retaining its own temperament, be not easily dissolved into ferocities injurious to the Lungs, it behoves that as well the acidities of it self as of other humors mixt therewith, and chiefly the nervous and limpid ones be destroyed: which intention Medicines prepared with Brimstone will best accomplish; which for that cause in this case (provided a hectic Fever be not present) may be more frequently and in abundance taken. Wherefore the Tincture, the Balsam, the Syrup, the Flowers, and Milk of Sulphur in somewhat a large Dose may be exhibited twice or thrice a day. For the same reason traumatic or vulnerary Decoctions, also Decoctions of the pectoral Herbs commonly so called, also of the Woods, are to be taken instead of ordinary drink. Moreover the Powder of Crabs eyes, Hog-lice, and other things endued with an Alkali or volatile Salt are often administered with great success. The third intention of healing respecting the first indication, *viz.* that the superfluous dregs of the depraved blood, (if they shall be very much predominant) being commanded out from the Lungs, may be discharged by other Emunctories, suggests very many ways to be used for their dispatch. For besides Phlebotomy, Diuresis, and sometimes a gentle Purgation (which take place in all Coughs, yea in the beginning of a consumptive Cough, or Phthisis) *hither* also ought to be referred Baths, taking in a more warm air whereby they may more freely transpire, also Frictions of the extreme parts, Dropaces, Issues, Blisterings, or Depilatories, Errhines, Gargles, and other private or public sluices either of humors or vapors.

2. That the acidities of the blood and other humours be taken away.

3. That the excrements of the blood be drawn off from the Lungs.

The second indication in the beginning of a Phthisis, *viz.* that the consumptive matter laid aside within the Lungs may be easily and daily evacuated, is performed by expectorating Medicines. These are said to operate after a twofold matter, according to which their virtue is conveyed two ways to the Lungs. For of those being taken by the mouth, some immediately dismiss their active particles into the Trachea, which partly by making the way slippery, and loosning the matter impacted, and partly by provoking the excretory Fibres into Convulsions, do procure expectoration: in which number are chiefly accounted Linctus's and Fumigations. The expectorating Remedies of another kind, which deservedly are accounted more available, do exercise their energie by the passage of the blood. For whereas they consist of such kind of particles which cannot be digested and assimilated by the mass of blood, being spread through the blood, because they cannot be mixt with it, they are presently again exterminated, and so penetrate from the pneumonic Arteries into the tracheal passages; where lighting on the matter they divide, and attenuate, and so disturb it, that the little fibres being irritated from thence, and successively contracted while they cough, the contents of the Trachea and of its little bladders are ejected upwards into the mouth. Medicines proper for this use besides Sulphur and the preparations of it, are artificial Balsams distilled with Oil of Turpentine, Tinctures and Syrups of Gum Ammoniac, Galbanum, Asa foetida, Garlick, Leeks, and such like yielding a strong scent; from which also Lohochs and Eclegma's are prepared. And these work both ways, partly by slipping into the Trachea, and partly by entering the Lungs by the circulation of the blood, and assault the morbid matter both before and behind, and so exclude it with the greater force.

Second indication requires expectorating Medicines.

3. What belongs to the third indication, *viz.* that the frame of the Lungs being hurt, or their constitution vitiated, may be either restored or amended; such things are of use as resisting putrefaction do cleanse, heal, dry, and strengthen; to which intent also Remedies prepared of Sulphur, Balsamics and Vulneraries do agree. Hence some Empirics do not only successfully prescribe the smoak of Sulphur vivum, but also of Auripigmentum, to be sucked through a Pipe or Funnel into the Lungs. Moreover it is for this reason, that change of air and soil, *viz.* from Cities to the Country or sulphureous air, or the passage from one Region into another that is hotter, is of such a signal advantage.

Third indication is performed by Balsamics and vulneraries.

Hitherto of the Method of Healing, which seems to be of use against the more painful Cough, or Phthisis beginning; now it remains according to all those curatory indications to subjoin certain select forms of Medicines, which also, according to the way of healing described above in a slight Cough which is short of a Phthisis, we shall distinguish into certain ranks, *viz.* which are Mixtures, Linctus's, Lohochs, Tinctures, Balsams, Troches, Lozenges, Powders, Pills, Decoctions, and distilled Waters. We shall set down some Examples of each of these: whereto also may be referred some of the forms of Medicines before described for a beginning Cough, and not as yet consumptive.

Forms of remedies for a consumption.

1. Magisterial Medicines and Syrups.

Mixtures.

Take of our Syrup of Sulphur three ounces, water of Earth-worms an ounce, tincture of Saffron two drams, mingle them. Take one spoonful at night, and first in the morning.

Take of Syrup of the juice of Ground-Ivy three ounces, Snail-water an ounce, flour of Brimstone a dram, mix them by shaking. The Dose one spoonful at night and morning.

Take of tincture of Sulphur two drams, Laudanum tartarizated a dram, Syrup of the juice of Ground-ivy two ounces, Cinamon-water two drams: the dose one spoonful at bedtime, and if sleep be wanting, towards morning.

Syrupus Diafulphuris.

Syrups.

Take of Sulphur prepared after our manner half an ounce, best Canary-wine two pints, let them be digested 28 hours in a water or sand Bath; which being done, take of the finest Sugar two pounds dissolved in Elder-flower-water, and boil to a height to make tablets: afterwards pour to it by little and little Wine coloured with Sulphur and warm, let it boil a little on the fire, strain it through woolen. You will have a most delicate Syrup of a gold colour, and for coughs and other distempers of the lungs (where a hectic Fever and heat of the Pericardium is absent) most profitable: the dose a spoonful morning and evening by it self or with other Pectorals.

Syrup of Garlick.

Take ten or twelve cloves of Garlick stript from the little skins, and cut into slices, Aniseeds bruised half an ounce, Elicampne sliced three drams, Liquorish two drams, let them digest for two or three days in a pint and half of spirit of Wine close and warm; strain it clear and hot into a silver dish, and add a pound and half of fine Sugar, the dish standing upon hot coals, let the liquor be fired, and while it burns stir it; and strain it through woolen, and keep it for use.

Syrup of Turneps.

Take Turneps sliced and fine Sugar of each half a pound, put them in a glazed pot a lay of Turneps and a lay of Sugar, the pot being covered with paper, put it into an oven to bake with the bread; when it is taken out, press the liquor, and keep it for use: the dose one spoonful morning and evening.

Syrup of Snails.

Take fresh Snails with their shells n. xl. cleanse them with a linen cloth, afterwards each being run through with a bodkin, let the open shell be filled with powder of Sugar-candy, and being put in a linen bag, let them be hung in a cellar, it will dissolve into a Syrup and drop into a glass vessel set under it: the dose one spoonful twice or thrice a day in a convenient vehicle, viz. Milk-water or pectoral Decoction.

2. & 3. Linctus's and Lohochs.

Linctus's.

Take of conserve of red Roses three ounces, of our tincture of Sulphur two drams, mix them in a glass mortar: the dose the quantity of a Nutmeg evening and morning. To this sometimes to appease a troublesome cough add from half to a dram of powder of Olibanum.

Lohoch.

Take conserve of red Roses four ounces, flour of Brimstone four scruples, fine oyl of Turpentine a dram, powder of Fox-lungs three drams, syrup of the juice of Ground-Ivy as much as will suffice to make a soft Lohoch, to be taken after the same manner, viz. morning and evening; also to be licked at other times with a Liquorish-stick.

Take powder of Sugar-candy four drams, tincture of Sulphur two drams, mix it in a glass mortar: take it after the same manner.

In the place of Tincture of Sulphur may be administred other balsamic Tinctures, viz. Balsam of Peru, Opobalsamum, Gum of Ivy, Guajacum, Amber, with many others, which either may be mixt with Conserve of red Roses, or with the Conserve of the flowers of Colts-foot, or with Sugar-candy.

4, 5. Tinctures and Balsams of the same nature and composition, but in a larger Dose are convenient in a Phthisis, which we have above prescribed for a beginning Cough.

Take

Take of Tar an ounce, Lime-water thrice cobobated two pints, distil it in a Bath to half; afterwards being filtrated, let it be drawn off to the consistence of Honey in Balneo; to which pour half a pound of tincture of Salt of Tartar, let it digest in a close glass to extract the tincture: the dose from 20 drops to 30 in a fit vehicle. After the same manner is prepared the tincture of the black oyl of Soot, liquid Amber, liquid Storax, and many others.

Take of our prepared Sulphur an ounce, adding Mirrh, Aloes, and Olibanum in treble quantity, draw off a tincture with oyl of Turpentine, also with rectified spirit of Wine: dose from 15 drops to 20.

6, 7, 8. Troches, Lozenges, and Powders, because they chiefly respect a Cough, are almost of the same nature and composition with those before described for a new Cough; unless that for the drying and healing of the Lungs things sulphureous and Vulneraries are required in a greater proportion.

Take powder of the leaves of Ground-Ivy a dram, flour of Brimstone two drams, of Sugar penids a dram and half, with juyce of Liquorish dissolved in Hysop-water make troches of the weight of half a dram.

Take of Yarrow bruised and dried in the Sun half a dram, flour of Brimstone, Olibanum, of each a dram; powder of dried red Roses half a dram, Sugar dissolved and boiled to a height six drams, oyl of Aniseeds a scruple and half, make Lozenges of half a dram weight: take one three times or oftner in a day, and especially evening and morning.

9. Pills.

Take a pint of the juyce of Ground-Ivy clarified in the Sun, flowers of Colts-foot dried, the tops of Hysop, Sage, Pennyroyal, each a handful; Aniseed, Caraway-seeds, sweet Fennel-seeds bruised, each half an ounce; distil them in Balneo Maria to half; strain it and distil it to the consistence of Pills, by adding half a dram of juyce of Liquorish, powder of Elicampane, flour of Brimstone, each three drams; flowers of Benzoin a dram, Balsam of Peru half a dram, tincture of Sulphur three drams, tartarized Laudanum two drams: make it into a mass, and form it into small Pills to be taken three or four evening, and first in the morning.

10. Decoctions, as I have above prescribed for a stubborn Cough, are used with success against a beginning Phthisis. In a case almost desperate I have prescribed the following Decoction to be taken twice a day, and also instead of ordinary drink with very good success.

Take Lignum vitæ four ounces, China, Sassafras, each two ounces; of all the Sanders each an ounce, shavings of Ivory, Harts-horn, each three drams: infuse them, and boil them in twelve pints of Spring-water to half, adding Liquorish an ounce, Raisins stoned four ounces: strain it.

11. Distilled Waters, such as we have before prescribed, are specific here, whereto may be added Solenander-water of Hogs blood and Turpentine; also Balsamic Waters distilled from Turpentine with Pectoral Ingredients.

Take leaves of Ground-Ivy, white Horehound, Hysop, Pennyroyal, each three handfuls; roots of Elicampane, Orris of Florence, each two ounces; Turpentine dissolved in Oyl of Tartar four ounces, Hysop-water four pints, Malaga-wine two pints; distil them in a sand Bath: let all the liquor be mixed, the Oyl separated: the dose two or three spoonfuls twice a day, with a spoonful of Syrup of Ground-Ivy.

12. In the last place we must describe the forms of Vapors and Fumes; the administration whereof doth use to profit more than any other remedies in a Phthisis not yet desperate, for that they arrive at the very Lungs, and so purge them by an immediate affect, dry them, and keep them from putrefaction, strengthen and open all their passages. 1. Therefore a moist steam may be made after this following manner.

Take leaves of Hysop, Ground-Ivy, white Horehound, each two handfuls; Elicampane two ounces, Calamus aromaticus half an ounce, Aniseeds and Caraway-seeds, each an ounce: boil them in a sufficient quantity of Spring-water: let the vapor of the hot strained liquor be drawn by the lungs through a paper rolled up like a cone or funnel: and used morning and evening for a quarter of an hour.

2. A fumigation or dry vapour, is made one while more mild out of meer Balsamics, another while more strong out of Sulphurs, and sometimes out of Arsenicals.

Forms of the
more gentle
Fume.

Take of Olibanum, white Amber, Benzoin, of each two drams, Gum Guaiaci, Balsam of Tolu of each one dram and half, powder of red Roses, and red Sanders, of each one dram to be strewed upon burning coals.

Of the more
strong.

Take Gum of Ivie, Frankincense, of each two drams, Flower of Brimstone one dram and half, Mastich one dram, with a dissolution of gum Tragacanth, form Troches.

Arsenicals.

Take of white Amber, Olibanum, of each two drams, prepared Orpiment half an Ounce, Styrax, Labdanum, of each one dram and half, with solution of Gum tragacanth, make Troches for fumigation.

Smoak of Auri-
pigment.

Mountebanks do ordinarily prescribe the smoak of Arsnick to be sucked into the mouth, like Tobacco kindled in a Pipe, and sometimes with good success: Moreover, it is in practice with the Vulgar, to burn like Tobacco in a Pipe little bits of cloth stained with Arsenick (such as wherewith the walls of Taverns are hung) and so suck the smoak into the consumptive Lungs for cure.

Of a confirm'd
Consumption.

3. These things being thus unfolded concerning a Cough, and a Phthisis beginning, both as to what belongs to the Pathologie, and cure; it remains now lastly to discourse of a more painfull Phthisis confirm'd, and almost desperate; and to consult what is to be perform'd, when the lungs being very much vitiated, and affected with one or more filthy ulcers, neither the air nor the blood do rightly pass through them, but choke or corrupt the mass thereof, by continually suggesting filthy corruption; insomuch that a hec tick fever and an Atrophie, by reason of nourishment being frustrated, infest the diseased, with the loss of all their faculties, and by daily weakening their strength precipitate them to the grave. The most certain sign of this disease growing desperate, uses to be accounted a pain very troublesome with an inflammation of the throat; for this symptom argues a great putrefaction of the lungs, from whence the putrid effluvia's exhaling are thrown about in the narrow passage of the throat, which wound and grievously irritate those tender fibres there. In this case the cleansing of the lungs, as also the drying up of the Ulcer are in vain designed: for all hotter Medicines ordain'd for those purposes, and fit enough in the beginning of a Phthisis, are not to be endured in a confirmed one; inasmuch as augmenting the inflammation of the lungs, they procure a hec tick fever, thirst, watchings, and other more painfull symptoms, or call them back afresh. For truly in such a state of this disease where onely the prolongation of life is proposed with a light toleration and an easie death; those remedies help chiefly, which bridle the fervour of the blood, allay the heat in the *Præcordia*, and restore the spirits, and gently cherish them. Hence for food, Asses Milk, also Water-gruel, Barly-broths, Cream of Barly, and for drink, Ptisan, Emulsions, water of milk distilled with Snails and temperate pectoral herbs, are usually of greatest success. Syrups and Linctus's, which appease the inflammation of the throat and Lungs, and facilitate expectoration, but chiefly the more mild Hypnoticks, whereby moderate rest may be procured, may be frequently or daily taken. The forms of these are common enough; but however according to our method, we will annex some of the more select of each kind.

The formal rea-
son thereof.

Forms of reme-
dies in a despe-
rate Consump-
tion.

Decoctions.

Take of Barly half an ounce, candied Eringo roots 6 drams, parings of Apples one handfull, Raisins stoned two ounces, Liquorish three drams, boyl them in three pints of Spring-water to two, make a Ptisan to restrain thirst: take it 3 or 4 times a day, also in the room of ordinary drink if it agree.

Take the tayls of twenty Crevises, candied Eringo roots one ounce, a crust of white-bread, Raisins stoned two ounces, Liquorish 3 drams, boyl them in 3 pints of Spring-water to two, strain it, and take 3 or 4 ounces three times a day. After the same manner is prepared the Decoction of Snails.

Distilled wa-
ters.

Take of Snails half-boyled and cut three pound, ground-Ivy 6 handfulls, Nutmegs sliced numb. 6. crum of white-bread two pound, fresh milk 8 pounds, distill it in a Pewter Still. The same way is distilled the water of Crevises-tayls. The dose 3 or 4 ounces three times a day, sweetned with pearl'd Sugar or Sugar of Roses.

Hypnoticks.

Take ears of green Wheat as many as convenient, distill them in a common still; drink three or four ounces three times a day, sweeten'd with pearl'd Sugar.

Take

Take Syrup de Meconio three ounces, water of green Wheat 6 ounces, mix them, drink two Hypnoticks, or three spoonfulls at bed-time, every or every other night.

Take Conserve of Mallow-flowers wild or garden three ounces, Lohoch de pino two ounces, Syrup of Fijubes two ounces; make a Lohoch, of which take often a dram and half or two drams. *Elegma's.*

What hitherto we have discoursed of concerning a Cough of every kind (whether it be solitary and simple, or the forerunner and companion of a Phthisis) also what is to be prescrib'd in every case touching the method of healing, it would be easily illustrated by the history of Cures, or by the Anatomical observations on those that have dyed by that disease. For instances of this sort, and very many examples are every where had, and happen daily; it pleases us here to annex a few of the more select, out of the large choice of these, accommodated to the chief kinds of a Cough, and Phthisis. And first I will endeavour to illustrate the type of a simple Cough by one history or two, and which takes its rise of it self, and is altogether void of the suspicion of a Phthisis.

It is now many years since I took care of the health of a certain Student, obnoxious to a Cough from his tender years, and who was wont frequently to undergo the more painfull affections of it, and those of long continuance. This person seemed of a melancholick temper, of a sharp wit, of an indefatigable spirit, of a constitution indifferently strong, but that his Lungs originally being infirm, did suffer when the blood dissolv'd into ferocities. In Summer as long as he transpired freely, he lived healthily enough; but in the Spring and Autumn, when the blood changing its temperament, those ferous fluxes came upon him either of their own accord, or from any slight occasion, he fell easily into a Cough with abundant and thick spittle; notwithstanding this distemper frequently within six or seven dayes, as soon as the mass of blood was purged throughly by the Lungs, vanished leisurely without any great use of remedies. But if to the aforesaid occasions of this disease were added some stronger causes, as chiefly the obstruction of the pores, and errors touching his diet, sometimes a more prodigious and stubborn cough, neither presently nor easily yielding to remedies, and threatening nothing less than a Phthisis, did come upon him; then manifestly the patient for the first days suffered light shiverings in his whole body, and the sense of a Catarrh in his Larynx; afterwards by frequent coughing with thin spittle, together with a giddiness, he was afflicted with numbness of his senses, and a dropping at his nostrils.

The History of a Cough threatening a Consumption.

In this state his best remedy was wont to be, and frequently tryed with success, to drink a little more freely generous Wine, and any other liquor very sparingly: for so the acidity and fluor of the blood being suppressed, and transpiration procured more freely, he was much eased, and sometimes recovered health in a short time. Moreover at night and early in the morning he was used to take seven or eight drops of the tincture of Sulphur in a spoonfull of Syrup of Violets, or of the Juice of Ground Ivy, or

Take Conserve of red Roses three ounces, spirit of Turpentine two drams mingled, the dose the quantity of a chefnut evening and morning.

If that these remedies together with the Canary Antidote and thin diet effected little, the disease not being so cured, spinning out into a long period, and pressing him sharply for many weeks, yea sometimes months, it reduced the sick to a remarkable leanness, and to the very brink of the Grave. For then the Cough daily encreasing and being very troublesome, did very much impede and break his sleep; his strength languished, his appetite was dejected, heat and thirst molested him; in the mean time spittle every day encreased, and was cast forth in great plenty; so that not only the *Serum* of the blood, and the recrements, but also the nutritive Juice, and the drainings of the solid parts being continually poured out upon the lungs, turn'd into corruption, which was abundantly cough'd out; moreover his breath was difficult, his joints very infirm, and his flesh very much consumed.

When of late our patient laboured after this manner, we prescribed the following method, and remedies, by the continued use whereof at length he recovered his health. First of all, a thinner diet being appointed him, and for the most part Ale being forbidden altogether, he took twice in the day of the following Apozeme about six ounces warm, and a little at other times cold to restrain his thirst.

Take

Take of the roots of China two ounces, Sarsaparilla three ounces, white and yellow Sanders of each one ounce, Ivory and Harts-horn of each three drams; infuse and boyl them in 8 pints of water to half, adding Raisins of the Sun 3 ounces, Liquorish 3 drams, strain it, and keep it for ordinary drink.

Take tincture of Sulphur three drams, take from seven drops to ten, at night and in the morning, in a spoonfull of syrup of Violets, or of syrup of the juice of Ground-Ivy.

When he began by continual use to nauseate this Medicine, in its place the following Eclegma was appointed.

Take conserve of red Roses three ounces, spirit of Turpentine two drams, mix them; the dose is one dram, at the same hours.

Afterwards instead hereof the following Powder was sometimes taken.

Take of the powder of the leaves of ground-Ivy dried in the Summer Sun three ounces, Sugar-candy half an ounce, mix them, the dose half a spoonfull twice in a day, with three ounces of the following water.

Take Ground-Ivy 6 handfulls, Hyssop, white Hore-bound, of each 4 handfulls, Lambs-lungs half-boyl'd and cut small, pour upon them eight pound of Posset-drink made with small ale, distill it in common Organs, the liquor being mixed, let it be sweetned to the taste as it is used with Sugar-candy or syrup of Violets.

Troches.

To appease his almost continually troublesome Cough, he swallowed the following Troches, and sometimes a little of the extract of Liquorish.

Take of the species of *Diatragacanth. frig.* 3 drams, Annise, Carue, sweet Fennel-seeds, of each half a dram, flower of Brimstone two scruples, flowers of Benzoin one scruple; extract of Liquorish dissolv'd in Hyssop-water; make a paste which form into Troches.
Or,

Take of Species *Diaireos, è pulm. Vulpis*, of each two drams, flower of Sulphur, of Elecampane, of each half a dram, Oyl of Anniseeds ℞. Sugar dissolv'd in a sufficient quantity of Penmiroyal-water and boyl'd to a body ʒvj. form Lozenges of half a dram weight, let him eat one, swallowing it by degrees, as oft as he will.

In the midst of this course, although he was endowed with a weak pulse and more cold temperature, we breath'd a vein in his arm: moreover, with these remedies, the chiefest help accrued to him from the open air, which for the most part he daily enjoyed, either by riding on Horse-back, or in a Coach; for from hence he first began to recover his appetite, his digestion, and sleep; whereto afterwards a relaxation of the other symptoms did sensibly follow, till at length he recovered his entire health. As often as he was afflicted since then with a stubborn and tedious Cough, he used a method like this, and with the like success; and now although he lives altogether exempt from that distemper, notwithstanding he is constrained to decline carefully all occasions or causes whereby either the pores might be shut, or the flux of blood or its precipitation into serosities might be provok'd; which were chiefly his going by water on the Thames at London, and drinking of acid liquors, as Cider, French or Rhenish wine.

From the above-mentioned history, you may easily conceive both the means and the reason of healing of the Cough, (which caused by the fault of the blood, is without the limits of a Phthisis): The other follows, which illustrates the nature of the same distemper, when it chiefly proceeds from the nervous juice.

The second remarkable History.

A hooping cough.

A Boy about ten years of age, of a hot temper and fresh countenance, from his infancy obnoxious to a frequent Cough, in his succeeding years sustained more grievous and lasting fits and assaults of this distemper, and by turns was used to labour with a strong and shrill Cough, without spitting, which almost continually afflicted him day and night, and so infesting him many days, yea weeks, brought the sick to utter weakness. Afterwards the period of his disease being come (which happened not but by consuming the store of the morbid matter) he again in a short time became healthy enough, and very free from any sickness of the Thorax: till the morbid matter (as it seems) being heaped again to great abundance, without any evident cause, the same distemper

temper returned and performed its Tragedy with its wonted fierceness. About its first beginning the Cough was troublesome only morning and evening: afterwards the evil by little and little increasing, he almost continually coughed whole days and nights, and if at any time sleep happening of it self, or by the use of Anodynes, afforded any truce, a more outrageous fit of coughing succeeded his waking. After this manner most frequently and fiercely coughing without any spittle, he laboured for three or four weeks, till he was brought to an extreme leanness and weakness; and then the sickness leisurely remitted, so that he coughed somewhat seldomer, and enjoyed moderate sleeps; afterwards in few days growing very hungry, being quickly made full of flesh and vigorous, he recovered his former health in a short time. Fits of this kind more seldom infested him in Summer-season, but in the rest of the year, repeated three or four turns, and brought the sick even into great hazard of life.

If disquisition be made of the nature, causes, and formal reason of this unwonted and as it were irregular kind of Cough, it is manifest it proceeds like all others, from the provocation of the Lungs; nevertheless as to the matter exciting, its seat, and manner of affecting it is doubted: because neither thick spittle, nor plentiful thin (as is usual in other distempers) is here cast out; neither doth the Patient complain of feeling a Catarrh, nor of any weight of the Lungs. Wherefore, not as in a common Cough, does the serous humour either slowly or plentifully sweating out of the Trachea or pneumonic vessels into the little bladders or pipes of the Trachea, induce the afore-mentioned symptoms: But it is plain from thence that the passages of the *aspera Arteria* are wholly empty of the serous or thick humour, because the deep and founding Cough throws off nothing. Moreover, neither from the blood impacted in the Membranes of the Lungs, doth this Cough take its origine, because neither fever, nor thirst, nor pain are present here as in a Peripneumonie. Besides, neither doth the morbid matter seem to adhere to the nerves or muscles appointed to the function of breathing; because then besides a Cough, Asthmatical or otherwise convulsive fits would sometimes urge with a sense of strangling; which notwithstanding did not happen to our patient.

Having frequently and seriously meditated about the ætiologies of this very difficult case, I am at length induced to think, that a certain serous and sharp matter, as being loaded with a scorbutical taint, falling from the head by the passage of the nerves, doth enter into the nervous fibres and Membranes of the lungs or Trachea; which cleaving thoroughly to them, is by degrees encreased to a fulness, and at length being chaf'd, and grown turgid with a perpetual provocation, creates so troublesome a Cough. We have in another place declared the matter of this kind impacted in the Coats of the guts, and the neighbouring parts about them, not rarely to excite a scorbutical Colick, for many days, yea sometimes weeks, infesting them with vomiting and a most sharp torment; and what else is this Cough, but a certain convulsive distemper of the lungs, whose taint notwithstanding, according to the capacity of the part labouring, is impress'd rather and more on the motive, than on the sensitive Power. For the lungs however twicht and hurt, do suffer small pain, or scarce any at all; notwithstanding from any light occasion, they are invaded by storms and fits of coughing. Indeed we compare this distemper of coughing so much the rather to the Colick, because the subjects of either of them, that is to say, the Trachea, and the guts, as to their coats, vessels, little fibres and glandules, are after the same manner fashioned.

*The conjunct
cause of the
disease.*

The chief cause of the Cough now described, depends upon the morbid matter heaped together within the little fibres of the rough arteries, to a provoking fulness; wherewith when they are loaded, first a quick and painfull breathing infests onely, with a mornings Cough; because from the beginning onely some small portion of that matter being disquieted provokes the part: afterwards when the whole mass thereof growing turgid, almost perpetually twitches the fibres, there follows a most troublesome cough; which also being often repeated, endures a long season; because the morbid mass impacted in the parts affected, is neither presently cast off by the strength of nature, nor easily gives place to any remedies.

For in all the fits of this disease, I have made tryal of various methods of curing, and of medicines of divers kinds, though with little success. That distemper beginning at any time, is wont to make a long period, maugre all remedies. The medicines commonly called pectoral, as Syrups, Lohochs, Eclegma's, or Lambitives, have conferred little benefit to its cure; notwithstanding sometimes it hath seemed good to

admit of them into use for this purpose, that they might make slippery and moisten the Lungs, lest they run the hazard of being rent by a violent Cough, and their vessels burst asunder: for sometimes a more fierce fit troubling our sick Patient, he hath been wont to cough out a little blood, though no thick spittle.

A gentle Purge both in the beginning and declination of this distemper hath succeeded well. Opening and diuretical Apozemes are ever administered with success, both which he used enough through his whole course instead of ordinary drink. Evening and morning he took some drops of the Tincture of Sulphur with the Milk-water of Snails; late at night I was sometimes constrained to administer a Dose of Diacodion or of liquid Laudanum: his belly for the most part loose enough, that it seldom required Clysters: in two of his fits he breathed a vein, whereby nothing of success ensued.

*The usual method
of curing.*

In the last fit, beginning about the Autumnal Equinoctial, which passed away a little more lightly and gently, this following method of healing was observed.

A Purge.

First of all this Purge was given, and after four days repeated. *Take of Mercurius dulcis ten grains, Resine of Jallop four grains, mix and make a powder to be taken in a spoonful of Syrup of Violets.*

A Drink.

Take China roots sliced a dram, Grass-roots three ounces, Chervil an ounce, candid Eringo six drams, shavings of Ivory, Harts-horn, each three drams; Raisins of the Sun stoned three ounces: boil these in three pints of Spring-water to two pints, strain it, and use it for ordinary drink.

A Mixture.

Take Syrup of Fijubes two ounces, Diacodion an ounce, spirit of Salt Armoniac with Gum Ammoniac a dram, mix them: the dose a spoonful at night and early in the morning. He was much relieved with this medicine, notwithstanding he took it only every other or third day, and for change sometimes a dose of the tincture of Sulphur with Syrup of Violets.

The disease declining a Purge was twice repeated, and afterwards, recovering his health by degrees, within two weeks he became healthy enough. But when I beheld him not only obnoxious to frequent relapses of coughing, but every fit to be irresistible when it assaulted him, and its stay very long notwithstanding the use of remedies, and all this threatening no less than a Phthisis at length; I advised that as well for his preservation, as for the more easie cure of the distemper, if it should return, he should travel into a hotter Region. Hereupon he did not much delay, but sails into France about the beginning of November, and from thence by a straight journey to Montpellier, where abiding half a year he was sick only twice and both times lightly: afterwards returning into England quite free from a Cough, praise be to God he enjoys his perfect health.

SECT. I. CHAP. VII.

Of Spitting Blood.

Hitherto of a Cough and Phthisis, as well in its beginning as confirmation; which are the most common affects of the Lungs, and most especially dangerous. Besides which there are many other diseases of those parts that do occur, which when they are not at all, or not seasonably enough cured, for the most part degenerate into a Phthisis. These passions, or at least the chief of them, (as we have before hinted) are spitting of blood, an Imposthume, or Ulcer of the Lungs, a Peripneumony, Empyema, a Pleurisie, a Tumor of the Lungs, and obstructions by reason of things divers ways concremented, viz. sometimes little Pustles and Scirrhus's, another while gravel and little stones, and sometimes other preternatural matter; and lastly hitherto belong an Asthma and convulsive distempers of the Breast. Of these we shall treat in order, and first of Spitting blood.

*Spitting blood
a distemper ve-
ry frequent.*

The spitting of blood out of the Lungs and the ejection thereof by Cough sometimes less and almost none, another while more violent, is a distemper frequent enough, and truly an admiration it is, that it happens not more frequently. For whereas the vessels bringing blood are divided into twigs and innumerable slips, and those very small; and whereas the blood even fiercely boiling, is violently conveyed through them all, complicated after divers manners and variously intorted; we can hardly conceive how the

the circulation thereof being so perplexed and intricate, and also so impetuous, should be performed without some impediment and interruption. And truly we conclude it to be very difficult in living bodies, because it hardly succeeds by injection in the dead: for as much as liquor sent through the entrance of the pneumonic Artery, will not readily and easily return by the Veins; but sticking longer in the passage, and skipping over the usual passages, variously runs out into the little bladders and other canals of the Trachea, and into the interspaces and other various gaps of the little Lobes.

Concerning an Hæmoptosis or spitting blood we are to consider, first out of what vessels, and by what distemper the blood bursts out; secondly in what places most frequently laid up; thirdly by what means it is wont either to be ejected or brought upward, that it may be discharged by the mouth.

Three things to be considered concerning it.

As to the first, we are to suppose by the Law of Circulation, that the blood of it self bursting out, doth altogether proceed from the Arteries: for the Veins, as long as they remain whole, do reduce it towards the Heart, and not at all pour it out; although we deny not that sometimes they being hurt by a wound, fall, bruise, or some violent accident, so as to be loosened from their unity, do let go the blood out of their cavities. Nevertheless the blood most commonly causing an Hæmoptoe or blood-spitting, proceeds from the little mouths of the Arteries being open or torn; and then the fault is wont to be either in the ill temperament of the blood, or ill framing of the vessels.

Out of what vessels the blood bursts out.

Of either of these there are various kinds and differences, which also concur after a diverse manner to provoke the spitting of blood. For the blood being sometimes more thin and also sharp, it unlocks or corrodes the mouths of the little Arteries; and sometimes again being more thick and prone to coagulate, when it cannot readily enough be received by the Veins, it is extravasated. By reason of these faults in the blood, they who labour with the Scurvy or with a pestilent Fever, as also those who have drunk some sort of poison, do frequently fall into a spitting of blood. Neither is this distemper less wont to arise from the fault of the vessels, in as much as those being too tender or too thin, many times are burst by a violent motion, as by coughing, hollowing, leaping, or other vehement exercises; or for that being too loose and moist, their mouths open, and suffer the blood to break out of its circulation: moreover sometimes for that the Veins being contracted and wrinkled by cold, do not readily pass away the blood, but the same restagnating distends the little Arteries, and bursts out of their mouths.

By what fault both of the vessels and of the blood it happens.

As to the Arteries, out of which the blood breaks, causing a spitting of blood, it concerns much of what sort they are, and where they are placed; for besides that there arise notable differences of bloody spittle, according as the blood breaks out from a smaller or a greater vessel; and if either of them be placed in the top of the Lungs near the Larynx, or in the middle region thereof among the greater branches of the vessels, or lastly in the lower region among the orbicular little bladders: moreover we observe, that the Arteries which use to void blood, are either of the number of them, which arising out of the pulmonary Trunk, do every where accompany the branches of the Trachea; or of those which owning their origine to the Aorta, do cover the coat of the Trachea with a thick branching.

What Arteries chiefly and where placed do void blood.

Both the pneumonic and tracheal are in fault.

For it is apparent (as we have declared before) from the mouths of these, as also of the Glandules, an unctuous humor sweats out to make the inner superficies of the Trachea slippery: moreover in as much as a serous humor distils abundantly out of the same into the cavity of the rough Artery, a Catarrh arises. Wherefore we doubt not at all to affirm, that even from the mouths of these being open, meer blood sometimes soaking into the Tracheal passages, does propagate a bloody spittle, though in quantity very small. I have observed many, who without a Cough or any indisposition of the Lungs, have once or twice a day voided one or two bloody spittles: which as often as it came upon them, the Patients perceived, either in the bottom of the throat, or on the top of the breast a kind of distillation; whence immediately by the meer contraction of the Tracheal Fibres, with a Snail-like motion, a little of the fluid blood being mixed thoroughly with slegm, and not at all frothy, is voided: and when sometimes that distemper had lasted for many months, no prejudice ensued from thence, which might bring or threaten a Phthisis: which would not have come to pass, if any of the pneumonic Vessels had been opened.

Spitting blood from the tracheal Arteries.

2. So much concerning Vessels voiding blood, and of their divers affections. What belongs to the places wherein the extravasated blood is deposited, these chiefly and almost only are the rough Artery, and the inward cavity of the parts thereof. For into this,

2. In what places the blood is deposited.

Either in the Larynx, or in the middle of the Bronchii, or in the orbicular little bladders.

this, as into a Jakes, all the filth or superfluities of all the rest of the passages are derived by the utmost endeavours of Nature, as far as is possible, to be presently sent out of doors. But if the extravasated blood be thrown into the interspaces of the little Lobes, or soaking out of the outer Membrane, fall into the cavity of the *Thorax*, it doth propagate an *Empyema*, and frequently an *Imposthume* in that place. But for the most part the blood subject to fall from the pulmonary course, produces various kinds of bloody spittle; according as it makes its nest, either upwards within the cavity of the Larynx, or a little beneath about the intermedial passages of the Trachea, or lastly further within the orbicular little bladders. The first distemper proceeds alone from the mouths of some Artery being opened, which covers the trunk of the Trachea; the next sometimes perhaps from this cause, yet more often from the pneumonic Arteries themselves being open or burst asunder, which vessels as they are greater, pour out often a dreadful quantity of blood; the spitting out whereof proves plentiful and violent, in regard that the muscles of the whole breast, together with the fibres of the Trachea are much provoked and greatly contracted. But if the spring of bloody spittle consists in the lowermost little bladders, the blood is thrown out more sparingly, but with a profound, frequent, and very troublesom Cough.

3. And from hence (which was in the third place purposed) the differences of bloody excretion out of the Lungs, and the manifold modes and courses of bloody spittle are made known. For the blood soaking into the Larynx, after a small tickling in the throat without coughing or hawking, doth easily and almost insensibly ascend into the mouth: and if an extravasation of this kind of blood happens in sleep, it presently flows out of the mouth upon wakening, they being scarce sensible of it; in as much as the moving fibres of the Trachea being contracted while one sleeps, have then emptied the blood fresh distilled into the mouth. But if from a greater vessel gaping or burst about the middle of the Lungs, the blood (which is ever frothy) does break out abundantly into the Tracheal passages, this by an outrageous Cough raised thereby is forthwith cast upwards with violence and in great plenty; insomuch that the sick seem rather to vomit than cough out blood. And finally, if the blood breaking out of the foldings of the vessels wherewith the orbicular little bladders are encompassed, falls down into those little cells, from thence it is discharged by turns in lesser quantity, and not unless by a strong and very frequent Cough.

The procatarttic and evident causes thereof.

So much concerning the formal reason, the conjunct causes and differences of an *Hæmoptoe*: as to what belongs to the primary and evident causes, either of them are manifold and various. In the former number are reckoned, first an hereditary indisposition of the Lungs, whenas they have originally been weak and soft with a straitness of the breast. Moreover their ill temper from a Cough, *Empyema*, or *Pleurisie* going before, and especially an obstruction or ill conformation do very much dispose to spitting blood, and so much the rather, if in such a habit an acrimony or *Dyscrasie* of the blood shall accrue from an ill course of Diet, unwholesom Air, or by any other means. The suppression of the Menstrua, the *Hæmorrhoids*, or blood flowing from the Nostrils incline most to a spitting blood. Secondly, among the evident causes ought to be reckoned primarily the excess either of heat or cold; for when the blood grows above measure hot, or the transpiration thereof through the Pores of the skin is hindered; thereupon swelling after a huge manner, it frequently bursts out of the pneumonic Vessels. From hence *Hippocrates* long ago observed, and as yet it is a vulgar observation, That spitting blood most frequently happens in the winter when the North-wind blows. Neither less seldom hath the use of bathing brought this evil upon many, before the use whereof they were healthful enough. Moreover many contract this from drinking of wine and strong waters, from a blow, a fall, hollowing, vomiting, coughing, or any other violent stirring of the whole body or of the Lungs. Also certain poisons, and according to *Heurnius* the Lunar beams (the reason whereof doth not easily appear, neither doth there remain any credit thereto) are reported to provoke this distemper.

The Prognostics of this disease.

The Prognostics of this disease are enough known to the vulgar, whereas there is not any one of them, who doth not suspect the spitting of blood as very dangerous. Nevertheless whereas the kinds hereof are various, one is found more or less dangerous than another. The blood soaking out of the vessels of the Trachea is often free from any evil: moreover when breaking out from the lowest and lesser pulmonar Vessels, it often admits of Cure; at least it is much safer than a plentiful spitting of blood happening from the great branches of the Artery being opened into the Trachea. But the predisposition of the Patient makes a great difference in the Prognosticks of this disease:

ease: for if blood-spitting be provoked by reason of a solitary evident cause, and shall happen to a body formerly sound and well set, there appears far greater hope of help, than if the distemper arising of its own accord shall happen to a cachectical, phthical, scorbutic, or otherwise sickly body. However 'tis a common observation, that this disease is dangerous and always difficult to cure: the reason whereof is also clearly manifest, for as much as the function of the Lungs consisting in a perpetual motion, is altogether contrary to the method of healing a wound, whereto primarily ease and rest are required. In like manner this happens to be a greater hindrance to its Cure, in as much as the frame of the Lungs is not a Parenchyma (as was thought) but a texture or very subtle web of innumerable vessels; the unity whereof if once dissolved, it will be altogether impossible for the ends of the disjointed vessels to meet again together, or the space to be filled up with flesh or callous, as in other parts. But there is this only to be hoped, that while the ends of the vessels grow together incongruously and always imperforated, the circulation of the blood ceasing in the part distempered, may be supplied by another neighbouring part: which indeed rarely succeeds without hurt or prejudice of the whole Lungs.

As to what appertains to the Method of healing the Hæmoptoe or spitting blood, *The Cure thereof.* the curative indications shall be chiefly these two, viz. to stay presently and restrain the flux of blood; then secondly, to heal the dissolution of unity without any relicts of a Consumption in the Lungs.

I. As to the former, these two things are chiefly to be procured, viz. first that blood *I. Indication.* flow not to the part distempered; and secondly, that in the mean time the opening of the vessel may be some-how shut.

1. That the blood may not flow to the part distempered, there are many intentions *1. It stops the* of healing in use, viz. it will be requisite to diminish the abundance of blood, to restrain *flux of blood.* the boiling thereof, to alter the intemperament, and depress its motion or divert it another way: for which purposes Phlebotomy, Ligatures, and Frictions are often convenient: also Juleps, Decoctions, Emulsions, and succulent Expressions of Herbs ought to be drunk. Likewise moderate Hypnotics, and in the first place Diacodiates are exhibited with success: for these, by restraining the motion of the Heart, do force the blood to cool.

2. That the opening of the vessel may be shut, astringent and agglutinating remedies are in the first place convenient. The chief of these are used to be exhibited in the form of a Linctus, so that while one swallows, certain particles gliding into the rough Artery, may more immediately communicate their power to the part diseased. But the reason of this operation seems not to be of any great moment; because the efficacy of the Medicines themselves, chiefly and almost only by the conduct of blood reaches to the seat of the disease. Wherefore not only Lohochs, but also Decoctions, Powders, and Pills of vulnerary and balsamic Ingredients are prescribed with success. The forms hereof we shall annex beneath.

II. The second indication, which is also preservatory, respecting the healing of the dissolution of unity without any remaining hurt of the Lungs, ought to provide *II. The second* against two sorts of evils, viz. lest the spitting blood (whereunto the distempered are *preservatory in-* afterwards always prone) begin again; and lest a Phthisis succeed, which threatens *dication.* every body subject to the Hæmoptosis. For these ends for the prevention of this disease daily care and constant course of healing ought to be ministered to the blood and Lungs.

1. As to the blood, the mass thereof ought to be contained ever in a due quantity, *1. It respects* and a right temperament, with a mild and equal motion. Hence lest it superabound, *the blood which* or distempered with a Dycrasie enter into turgescencies, or lodge its impure feculencies *is to be kept in a* in the breast: it is requisite sometimes to use Phlebotomy and a gentle Purgation. *right Crasis.* An exact course of Diet is always necessary. Moreover for the depurating and sweetening the blood, drinking of Asses milk, or of Medicinal waters sometimes does greatly help. But Decoctions, distilled Waters, Juices of Herbs, which carry away the ill temperaments of blood, and derive the Serum and other impurities from the Lungs, and bring them forth either by Sweat or Urine, are to be carefully drunk. Besides for this purpose Issues do chiefly conduce.

2. Neither ought there to be less care of the Lungs themselves, namely that *2. A due frame* the whole frame thereof, and chiefly the place affected, be preserved in due frame *of the Lungs to* and right tone. Hence every violent motion, whereby its unity is more dissolved, or *be procured.* the restitution thereof hindered, should be industriously declined. Let the party live *in*

in a clear and open air, but not too fierce, or sharp; let him abstain from grosser foods, from Noon-sleeps, from plentiful Suppers, and other errors in diet, which induce either repletion or obstruction upon the *Præcordia*. But let remedies be admitted in daily use, which by a peculiar property, or certain specifick vertue are reported to heal the Lungs.

The forms of Medicines.

The method of healing requisite for spitting of blood, being shadowed after this manner, there yet remains as to all the therapeutic indications, and according to the various intentions of healing which belong to them, for us to subjoyn some more choice forms of Remedies, whose Van those deservedly lead which meeting with the symptom most urging, do suddenly restrain the flux of blood cast out by coughing or otherwise out of the Lungs. In the first rank of these Medicines those are reckon'd which hinder the blood from flowing to the part affected, and together are impregnate with a certain astringitive and agglutinative power whereby the opening of the vessel may be shut; and after the Belly being cleared with a Clyster, and Phlebotomie (unless a weak pulse and defect of heat withstand it) made use of, there is wont to be given somewhat in form of a Julep, Decoction, Emulsion, juicy Expression, Powder, Pills or Lohochs. We will annex certain more elegant and more efficacious Receipts of all of these, as likewise of Narcoticks, which notwithstanding ought not every where and indifferently to be used, but methodically and seasonably, according to advice of a discreet Physician, according to the various constitution of the patient and condition of the disease.

1. Juleps and Distilled Waters.

Juleps.

Take of Purslain and Poppy-water of each 6 ounces, Dragons-blood in most fine powder half a dram, Syrup of red Poppies two ounces, Spirit of Vitriol of Mars ℥ss. mix them; the dose ℥ij. repeated once in 5 or 6 hours.

Take of Plantane-water ℔j. Gum Tragacanth and Arabick powder'd, of each ℥ss. mingle and dissolve them; after adding Syrup of dried Roses ℥j. make a Julep; the Dose ℥ij. or ℥iij. every third or fourth hour.

Take of the water of Oak-buds, red Roses, Water-lillies, of each ℥iij. of Blood-stone finely ground, Bole-Armenick powder'd, of each ℥ss. Syrup of Water-lillies ℥ij. mix them; the dose ℥ij. or ℥iij. three or four times a day.

Distilled Waters.

Take of the Dew or almost inspid Phlegm of Vitriol ℔j. Syr. of Myrtles ℥ij. mix them, the dose ℥ij. or ℥iij. often in the day or in the night.

Take of Cypress-tops M. viij. of the leaves or flowers of Willow M. vj. the greater Comfrey-roots, Water-lillies, of each ℔ss. Pomegranate-flowers M. ij. All being cut small together, pour on them ℔viiij. of new Milk; let it be distill'd in common Organs, the dose ℥iij. or iijj. often in a day.

Take of this distill'd Water, and of Plantane-water, of each ℔ss. Gum Tragacanth and Arabick of each ℥ij. dissolve them; the dose is ℥ij. every third hour.

The following Mixture is prescribed by Dr. Frederick Decker, to be taken a spoonfull at a time in spitting blood, and seems a very beneficial one.

Take of Plantane-water ℥ij. Cinnamon-water ℥ij. conf. of Hyacinth ℥i. distill'd Vinegar ℥ss. of red Coral prepar'd ℥ss. Balauſtins, Dragons-blood, of each ℥ss. Laudanum Opiate gr. iij. Syr. of Myrtles ℥j. mingle them.

A Julep.

Take of Plantane, red Rose, and Purslain-water, of each ℥iij. of Blood-stone and Dragons blood reduced into fine-powder, of each half a dram, Sugar-Candy ℥vj. make a Julep.

A Solution of common Vitriol, or of Vitriol of Mars made in Spring-water, and applied with a rag to a wound, wonderfully stops bleeding, but is scarcely convenient to be given inwardly.

2. Decoctions, Tinctures, and Emulsions.

Apozems.

Take the leaves of Blood-wort, Periwinkle, Mouse-ear, Plantane, Wood-sorrel, both sorts of Daisies, of each one handfull, red Rose leaves half a handfull, Barly half an ounce, Raisins two ounces, boyl them in three pints of Smith-forge water filtered, (or water wherein hot Iron hath been often quencht) to two pints. To the strain'd liquor add

add two ounces of the Syrup of the Juice of St. John's-wort, or of Mouse-ear, make an Apozeme, dose from four ounces to six, three times in a day.

Take the leaves of St. John's Wort, roots and leaves of Tormentil, of the greater Burnet, Meadow-sweet, of each one handfull, of the seeds of Purslain, Plantane, Sorrel, of each one dram, Conserve of red Roses half a pound, Spring-water eight pound, boyl them for 12 hours in Balneo Mariæ, to it being strained adde half a scruple of the spirit of Vitriol of Mars, to be taken as the former.

Take of Barly-water with Madder-roots boyled in it a pound and half, infuse in it being warm a handfull of red Rose-leaves, adding one scruple of spirit of Vitriol, after three hours strain it, adding Syrup of the Juice of St. John's wort one ounce and half, take three or four ounces, three or four times a day. Tinctures.

Take of the decoction of the roots of fresh Nettles a pound and a half, white Poppy and Henbane-seeds of each two drams, Melon-seeds 6 drams, make an Emulsion, sweeten it with Sugar penids; the dose is three ounces, three or four times in a day. Emulsions.

3. Juices of Herbs and juicy Expressions.

Take of the Juice of Plantane half a pound, take two or three drams three times a day, in 3 ounces of the distilled water prescribed before; sweeten it to please. Juyces of Herbs.

Take of fresh Nettles, Plantane, the smaller Daisies, of each 3 handfulls, bruise them, and pour upon them of Purslain-water 6 drams, make an expression, take it as the former.

4. Powders and Pills.

Take of the powder of Blood-stone, Dragons-blood, ground with Rose-water on a Marble, Pearles, of each one dram, Bole Armenick, and Earth of Lemnos, of each half a dram, Troches of Winter-cherries two drams, make a powder, divide it into twelve parts, one part to be taken three times a day in the former distill'd water. Powders.

Take of Henbane, white Poppy-seeds, of each 10 drams, sealed Earth, red Coral, of each 5 drams, Sugar of Roses three ounces, make a powder, the dose one dram morning and evening; this composition made up with a fit Syrup into a soft consistence, was anciently call'd and renowned in Germany, by the name of Helidæus Electuary.

The aforesaid Powders with the addition of Gum Tragacanth dissolv'd, or some fit Syrup, Pills may be reduced into Pills or Lozenges.

The spongy excrescence usually growing to the fruit of Hippis or Dog-bryar, reduced into powder, half a dram taken twice a day, is a very profitable remedy in spitting blood.

Take of Tarrow bruised and dried in the Summer-Sun as much as you please, reduce it into powder to be kept in a Glass; the dose from half a dram, to a dram twice a day in any convenient liquor.

Julius Cæsar Scaliger's Powder, or rather that of Serapion is mightily commended. Dose four drams, twice or thrice a day.

5. Lohochs and Electuaries.

Take conserve of red Roses, of Dog-rose, of each two ounces, powder of white Poppy and Henbane seeds, of each two drams, species Diatragacanth. frig. one dram and half, of Blood-stone, Dragons-blood prepared, of each half a dram, Syrup of red Poppyes what will suffice to make an Electuary. Take the quantity of a Chesnut evening and morning, at other times let him lick with a liquorish stick. Electuaries.

Take conserve of the greater Comfry flowers, of Water-lillies, of each an ounce and half, Troches of Winter-cherries, of Diatragacanth. frig. of each a dram and a half, Syrup of Fijubes what will suffice to make a soft Electuary, of which lick often. Lohochs.

Take of the white of an Egge well beaten two drams, Sugar of Roses one dram, of white Starch three drams, make a Lohoch to be taken often with a spoon.

Take of Conserve of red Roses 3 ounces, Leucatella's Balsam half an ounce, Troches of Winter-cherries two drams, Syrup of red Poppies what suffices to make a soft Lohoch: the dose is the quantity of a Chesnut night and morning.

The second Indication.

The first intention in respect of the blood.

II. The second preservatory Indication exhibits such remedies, which by containing the blood in its right temper, and the Lungs in their due frame, do provide against a relapse of spitting blood, and the following of a Phthisis. Such things which respect the blood, either are mild evacuators by Stool, Urine or Sweat; or are merely Alteratives. Every of these are usually prescrib'd either in form of Potion, Powder, Electuary, or Pills: We will here shew you the most select patterns of the chief of them.

A Purge.

1. As to Evacuators, a gentle Purgative is sometimes appointed after this manner.

Take of the best Senna three drams, Cassia fistula bruised one ounce, Tamarinds three drams, Coriander-seeds a dram and a half, boyl them in Spring-water to 6 ounces, to it strain'd add Syrup of Chicory with Rhubarb one ounce, clarify it with the white of an Egge. Or,

Take 4 ounces of Gereons decoction of Senna, Syrup of Apples purging one ounce, mingle them and make a potion.

Alteratives.

2. That the good temper of the blood may be preserved, and the superfluities drained from the Lungs may be continually discharged by Sweat and Urine, these following Alteratives, or some of them are for the most part receiv'd in constant use; which also being endued with a healing power, do succour the weak Lungs, or those whose Unity is dissolv'd.

For ordinary drink, let simple water, especially in a hot constitution, or being colour'd with a little Claret-wine, be drunk. Those with whom this doth not agree, a Bochet of China, Sarsa, with shavings of Ivory, Harts-horn, with white Sanders, or small Beer, or small Ale, with the leaves of Harts-tongue, Oak of Jerusalem, and the like infused, are frequently used with good success.

Pectoral Decoctions or Hydromels with temperate Vulneraries are taken twice or thrice a day to 6 or 7 ounces.

Decoctions.

Take of fresh Nettles, Chervil, of each one ounce, Harts-tongue, Speedwell, Mouse-ear, Ground-Ivy, St. Johns-wort, of each a hand-full, boyl them in three pints of Spring-water, to two pints, adding Raisins stoned an ounce and half, Liquorish two drams, to it strain'd add Syrup Byzantine two ounces, clarify it with the white of an Egge, make an Apozeme to be taken from 4 ounces to 6, twice or thrice in a day for a month. In a more cold or phlegmatick constitution, let the Liquorish and Raisins with the Syrup be omitted, adde at last of Hony well clarified two ounces, strain it and keep it for use. The Dose is the same.

The use of these is sometimes intermingled with a distilled water appropriate for that use, which likewise is more frequently taken by such who nauseate and loathe Apozemes.

A distilled water.

Take the tops of Cypress, leaves of Ground-Ivy, of each 6 handfulls, of Snails half boyled one pound and half, of all the Sanders bruised of each one ounce, being cut and bruised infuse them in 8 pound of fresh Milk, distill it in common Organs, the Dose 3 or 4 ounces with a spoonfull of Syrup of Ground-Ivy, to be taken twice in a day.

The second intention respects the Lungs.

2. In respect of the Lungs, viz. that without obstruction or opening of the vessels, the Union of parts, and due conformation of the whole may be preserved, temperate balsamicks chiefly conduce. To this intent Leucatello's Balsam is commonly prescribed to be taken daily and for a long season. Chymists and certain Noble women do cry up with great praise a balsamick Oyl drawn by distillation, called by them the Mother of Balsam.

It would be easie here to reckon up very many other remedies against spitting blood, very much celebrated by the ancient as well as by modern Writers; notwithstanding the harvest of these already gathered together doth at present seem rich enough. But it remains, that I illustrate as well the Theory of this disease, as the curatory method above delivered, by a History or two of sick Patients.

The first History.

A noble young man, when after a scorbutical Cachexia he was affected with a Palsie, and for curing this disease, remedies not only great but improporionate to the blood and spirits were experimented by him, viz. Salivation and the use of Baths, he

he contracted a spitting of blood, whose fits (of all I ever knew not presently mortal) were most fierce. Presently on the first appearance of this disease, spitting blood followed the Operation of *Hues's* powder (from which having for some time suffered a flowing of the Mouth, without his Palsie being cured he was reduced to great weakness:) Then being afflicted with a Catarrh, and a Cough very troublesome, he began to discharge a discolour'd Spittle, sometimes stained, and sometimes sprinkled with blood; but this disease being mild from the beginning, did suddenly vanish away by the use of remedies, and after going into the Countrey, and sucking in a more pure air, he became better, and after a while seeming healthful enough in his breast, he went to the Bath, for the benefit of his Palsie; where daily bathing for a fortnight in those hot waters, he again contracted a Cough, and a little after an horrid Hemoptoe or a spitting of blood, so that in the space of 24. hours, coughing often and plentifully, he poured out blood in a vast quantity.

I first visiting him in this condition, provision being made for the whole, I prescribed presently Phlebotomy for revulsions sake: notwithstanding after this administration (both then and ever after) he either repeated the bloody spittle, or grew worse. Moreover, I exhibited Juleps, Lohochs, Decoctions, and also Hypnoticks, which helping little or nothing, ligatures made about his arms and thighs, did first of all restrain the tyranny of this disease: And when afterwards the Evil broke out again, I perswaded him at length, (his drink of Beer being left) that he should constantly drink the decoction of China and Sarsa with the Pectorals. By the continual use hereof, observing moreover an exact course of diet, and altogether abstaining from wine, more hot aliments, and Salt, and Sugar, for above two years he was well in health.

But afterwards when by being crouded in a Court of Judicature, he grew mighty hot, he relapsed back again into a terrible spitting of blood. A Physician being sent for, he was presently let blood in the arm, whence his spitting of blood became more sharp; and when afterwards letting blood was repeated the second and third day, and the evil grew worse every time, at length Ligatures (as at first) being administered, and the pectoral drink and a Linctus being often taken, the disease presently remitted, and in a short space wholly ceased; notwithstanding he continued the use of his pectoral decoction and slender diet, viz. no flesh-meat, for a fortnight; and from thence he obtained truce from his enemy for three years; and when afterwards at any time the blood swelling by drinking of wine, or taking more dainty food, began to break out from the Lungs, presently by ligatures, and the use of the Decoction and Lohoch, and a thin diet, its assault was wont to be repulsed. But he did not so safely escape, but that it was necessary for him for the most part to keep perpetual watch against that enemy always lurking: for not long since by reason of the intemperature of the year, he contracted a troublesom Catarrh, with a Cough, a plentiful spittle, and sometimes bloody, and then the former medicines effected less; wherefore, he betook himself by his own advice to new things, and in the first place took evening and morning a spoonfull of Syrup of Ground-Ivy, and thereby ensued a notable help: but when that Syrup became quickly loathsome by reason of the Sugar, he took the powder of that herb well prepared to half a dram, or one dram twice a day in a spoonfull of some liquor; by the long use of which Medicine he was much better as to his Catarrh and Cough. But when the spitting of blood now and then broke out, though in little quantity, he chang'd again his Medicine, and took twice in a day the powder of the tops, and chiefly of the hairy excrescences of Cynorrhodon or Dog-bryer: which only medicine a certain Physician renowned formerly for the cure of spitting blood, used with great success. Neither did our Patient receive a less happy effect from that medicine, for presently after he escaped altogether free from a Cough, a Catarrh and bloody Spittle, and so remained for a long while: untill at length believing this disease of the Breast to be wholly subdued, and therefore slighting it, he assumed weapons against the other more ancient enemy the Palsie. Wherefore, while his Hemoptosis or Spitting of Blood was neglected, he daily took a large dose of hot Medicines to conquer that other distemper, viz. magistral waters distilled with Wine, spirit of Harts horn, of Sars Armoniack, and Aromatick Powders and Confections; Besides, whilst he indulg'd himself in a more plentiful diet, with a moderate drinking of Ale and Wine, the roaring Lion that at first seem'd to sleep, was again stirr'd up, viz. he had not long continued in that antiparalytical Method, but the Spitting of blood returned with its greatest fierceness, so that in the space of a day and a night he

coughed

coughed out above three pints of spumous blood. But afterwards a Physician being sent for who presently prescribed Phlebotomy, the spitting of blood began to cease upon bleeding (as formerly it was always wont to do) but then fell into sharp fits again: which however by the use of Ligatures, and a Lohoch and pectoral Decoction daily taken, was presently asswaged, and a while after wholly ceased. And when afterwards he used the pectoral Decoction three months, and a very slender Diet, viz. without any flesh, only of Herbs, Barley, &c. and Milk-meats, in a short time he recovered his former health, and now lives in that state, so triumphing over that cruel disease, that many Hemoptotic persons consult him as their Oracle, and for a Cure do propound a method of this kind of living to be followed before the Physicians advice.

The reason of the case.

What is most wonderful in this case is, that after so many breaches so often happening in the Lungs, this famous Person was not in the intervals affected with a Cough, neither fell afterwards into a Consumption; whereas most after any of the smallest vessels being open in the *Præcordia*, for some time after labour with a Cough with plentiful and thick spittle, and at length frequently become consumptive. And that it happened otherwise to our Patient, I chiefly attribute to the balsamic constitution of his blood, viz. in the mass whereof the serous recrements are either less collected, or so strictly mingled, that they cannot be easily separated thence; wherefore after the vessels were broken, or their unity dissolved, a plentiful Ichor or sharp humor (being wont to generate a Cough and spittle) did not sweat out as in many others. Moreover what he himself observed, contrary to many others, that his spitting blood happened never in winter, but in Summer, came also so to pass by the same reason: because when the blood did less abound with vaporous recrements, the opening or obstruction of the Pores were neither an advantage nor prejudice to it; nevertheless the blood growing hotter than it ought to be, seeing it exhaled not, there was a necessity it should break out of the vessels; and when again diminished in quantity, sending away little or no serous Ichor out of the orifices of the vessels, the spitting of blood ceased without a remaining Cough. The same reason holds of many that spit blood, wherefore some are found much inclinable, others not prone to a Consumption. This Gentleman ever found the use of the pectoral Decoction advantageous to him: wherefore when he often varied other Medicines he always retained the same Decoction: moreover he hath commended it to many others spitting blood with success. The form of the Prescription was this.

A Drink.

Take of all the Sanders of each six drams, infuse them for twelve hours in seven pints of Spring-water, then boil them to a consumption of a third part, after add leaves of Colts-foot, Maidenhair, Mouse-ear, Speedwel, flowers of St. Johns-wort, each two handfuls; sweet Fennel seeds six drams, Liquorish half an ounce, Raisins stoned half a pound: boil them to four pints, afterwards strain it, and keep it for ordinary drink.

Moreover the spitting blood threatening and pressing upon him he took thrice or oftener a day the quantity of a Nutmeg of the following Electuary, drinking after it seven spoonfuls of a Julep.

The Electuary.

Take conserve of red Roses three ounces, conserve of Hips, Comfrey, each an ounce and half; Dragons blood a dram, species of Hyacinth two scruples, red Coral a dram, with a sufficient quantity of Syrup of ree Poppies, mix them and make a soft Electuary: let him take hereof evening and morning a dram and half, drinking after a draught of the following Julep. At other times let him lick it with a Liquorish-stick.

The Julep.

Take Plantane and Spawn-Frog-water, each six drams; Syrup of Coral, dried Roses, each an ounce; Dragons blood two scruples: mix them, and make a Julep.

Among the examples of them that spit blood the case of that Reverend person Dr. Berwick S. T. P. and lately Dean of St. Pauls Church ought not to be omitted, which some while since I learned partly from the Patient himself, and partly was communicated to me from his Brother that most skilful Physician Dr. Berwick my most dear Friend.

The second History.

That most renowned Divine fifteen years before he died laboured with a most obstinate Cough, and sometimes with a bloody and salt spittle, with a grievous breath stinking like Hell; by which being made lean by a pining away of the body, he wanted but little of being almost extinguished by a Consumption. As often as his spitting blood intermitted, the rankness of breath and spittle ceased also; afterwards the return hereof declared constantly that other affect to be presently attendant. In this languish-

languishing condition, when this Renowned man was discovered to favour the Kings Party at that time oppressed with a grievous Tyranny, and being cast into a strait Prison, did drink meer water instead of ordinary drink, he recovered his health beyond the hope and expectation of all persons, and so remained indifferently healthful for above ten years space. Nevertheless afterwards, I know not by what occasion, unless by the hardship of a cold winter, not only the aforesaid evils, *viz.* a Cough with bloody and salt stinking spittle did become fierce upon him, but also over and above, a debility of stomach, want of appetite, and a nightly Fever did accrue. But not long after these Symptoms a little remitting, fair weather again seemed to shine out; until on a certain day, the air being suddenly changed into an intense cold, towards night he was assaulted with great straitness of breast and difficult breathing, with a quick and weak pulse, and fainting of all his spirits, as if he had been expiring. Nevertheless from this danger he suddenly escaped by the interposition of a Crisis, *viz.* by a plentiful spitting of blood, and after by a breathing Sweat: but from that time his spittle remitted much of the usual stench, and something of its saltness; and when in a short time afterwards the last and most painful invasion of spitting blood threatened him, that usual presage from stench of breath was wanting; but the subsequent spitting of blood being very plentiful, did so debilitate his strength, that from that time declining sensibly, he expired within a month: and when a little before his decease, by reason of a sharp pain in his side, a Vein was breathed, his blood seemed to fail so, that almost none streamed out. Moreover in his body dissected after death very little quantity of blood was found: nor could they find any footsteps of the other most notable Symptoms, *viz.* spitting of blood and of the stinking breath and spittle; for there was no collection of any filth or stinking and putrid matter, nor any cavity in the Lungs made by an Ulcer or Wound; but only one lobe of this bowel, or rather the whole left side was so hardened from a scirrhous Tumor, that the blood could not easily or but very little pass through the frame being so obstructed, and as it were stony: wherefore it is no marvel, if the blood that should have passed most swiftly through the Lungs, did now and then burst out in some place from the vessels, which were joined together, or suffered not a circulation by reason of the Schirrosity.

Notwithstanding here a greater difficulty ariseth, *viz.* whereas his Lungs were found altogether free from any Ulcer or notable wound, whence that most dire stench of spittle and breath, always a forerunner and companion of the bloody spittle (the last invasion of this disease only excepted) proceeded. We have in another place given remarks upon all these things, as that Ulcers of the Lungs and the purulent spittle of consumptive persons seldom or never stink, but the matter cast out of an Impothume of the Lungs doth frequently stink: but that in the sick Doctor the Lungs being free from either affect, breathed out so horrible a breath, the reason will best of all appear, if we inquire of the manner and cause of a stench in general. For we observe this to be excited when the impure Sulphur is dissolved either by a lixivial, or an acid Salt, and is precipitated by the other. Let common Sulphur, or Sulphur of Antimony be dissolved by Oil of Tartar or Stygian water; afterwards if you pour on this solution a dissolution of fixed Salt, and upon that, Vinegar, a most hideous stench will arise. In like manner we may conceive in the case proposed, that the sulphureous particles of the blood being very impure, were corroded by the fixt Salt, with which its juice abounded very much; afterwards when the acid humor, having endured a flux, reflows from the nervous parts into the mass of blood, it precipitates the dissolved Sulphur, and so causes that stench to be exhaled from the Lungs, and whilst it forces the blood into a turgency, a little after it compels to a spitting of blood. I have known some endued with a breast firm enough, and free from all Coughs and consumptive disposition, who have for the most part breathed out a most hideous stench: which could proceed from no other cause, besides what even now we have observed. The impure blood abounding with Sulphur dissolved with Salts, if perhaps while it is rarified within the Lungs, and loosed in its frame, it meets with an acid humor, it will exhale in breathing putrid and horrid effluvia's. It happens by the like reason of the blood otherwise disposed, that as the breath of some persons is very stinking, so of others very sweet. And indeed the breath or air reciprocated through Respiration, for that it carries out with it the effluvia's of blood highly rarified within the *Præcordia*, one while disperses a grateful vapor, another while a most unpleasant.

The reasons of the case.

S E C T. I. C H A P. VIII.

Of a Peripneumony, or Inflammation of the Lungs.

*The description
of a Peripneu-
mony.*

A Peripneumony is usually defined to be, an inflammation of the Lungs with an acute Feaver, a Cough, and difficult breathing. They who labour with this distemper are greatly sensible of a notable inflammation in their breast with a swelling of the Lungs, and sometimes a pricking pain, they draw a painful and short breath, or, as *Hippocrates* affirms, a deep breath; the Feaver presses with great thirst, watching, and painful Cough; whereto also bloody spittle, or streak with blood, succeeds. By which Symptoms it clearly appears, that this disease arises, in as much as the blood boiling feaverishly, doth not easily pass through the lesser pneumonic Vessels; but sticking in their passages, begets first an obstruction, afterwards being more heaped and extravasated, propagates a Phlegmon or inflammation with heat, a Cough, and discoloured spittle. Moreover in as much as the blood so accumulated and stagnating, puffs up these passages of the Lungs, and compresses them, a difficulty of breathing is caused; and in as much as it pulls or distends the nervous Fibres, a pain frequently arises.

*After what
manner a Phleg-
mon is bred in
the Lungs.*

But if it be asked, how a Phlegmon should grow together in the frame of a Lung merely bladdery and excarnous; and after what manner it is distinguished from that distemper which is wont to be stirred up in musculous flesh, or the substance of a bowel? We must answer, although the above-mentioned parts vary as to the texture, notwithstanding the reason of the affect is altogether the same in each of them. For the small sanguiferous vessels do every where alike embrace, bind, and variously gird about both all the Tracheal passages in the Lungs, and also the fleshy fibres in the Muscles, and lastly the little fibres and nervous threads, with the thickest foldings like clusters, of the Parenchyma. But that which produces a Phlegmon is the blood it self, which, while it grows very hot, and is hindred in its passage, every where, and especially in the Lungs, whose vessels branch into very small foldings, doth first beget an obstruction, and then an inflammation.

*The conjunct
cause of a Peri-
pneumony con-
sists in two
things.*

1. That the blood boils.
 2. That it sticks in the passages.
- Sometimes this disposition, sometimes that is first.*

Wherefore the formal reason and conjunct cause of a Peripneumony consists in these two things, viz. that the blood boils feaverishly, and sticking also within the more narrow passages of the Lungs, engenders there an obstruction causing inflammation. Unless these two things concur, there is an exemption from this disease; for in many other Feavers, especially in a burning Ague, though the blood, most intently heated and inflaming all the *Precordia*, as also in the longing of women, the Green-sickness and the Dropsie of the breast, is very clammy, yet though sticking very much in the passages of the Lungs, it does not stir up a Peripneumony: to produce which both distempers must concur and join their strength. Nevertheless when there is an indisposition of both these, one while this, another while that, is first in act, and after a sort one is the cause, or at least the occasion of the other. For sometimes the blood irritated into a Feaver causes an obstruction of the Lungs; and the blood also sometimes finding a remora in the Lungs, receives a feaverish boiling from its proper obstruction. Notwithstanding, for the constituting the procatactic cause of this disease, the blood ought to be fitted as well for the boiling, as for the obstructing the vessels of the Lungs.

*What that is
Phlebotomy dis-
covers.*

Though it will not be easie to shew what this disposition of the bloody liquor is inclining to a Peripneumony, yet the reason thereof doth something appear by Phlebotomy, always made use of in this disease with the best success. For the blood being drawn from any labouring with this disease, as also from those in a Pleurisie, after it grows cold, in its superficies instead of a Scarlet cream, it hath a little film somewhat white or otherwise discoloured growing on it, which also is very tough and viscous: whence we may conjecture, that the mass of blood being too strait in its frame, whilst that in the circulation it doth not discharge its recrements, grows too thick, and as it were clammy, and for that cause becomes too prone as well to boil as to stick within the narrow passages, and especially of the Lungs.

*What affection
of the blood pro-
duces it.*

But if farther inquisition be made, from whence this disposition of blood proceeds, by which it becomes clammy and viscous like ropy wine; the general reason hereof is this, viz. that the more thick parts of blood are not made thin enough by the more subtile; so that all of them being equally mixed and mutually incorporated, at length the good

good humors separate themselves into their appropriate functions, and the superfluous are perpetually discharged by their proper Emunctories. But on the other side in as much as the sulphureous particles of the blood being combined together with the saline and earthy too much exalted, ensnare and entangle all the rest; for that cause its liquor containing within it self all its recrements and impurities, grows clammy as glue, and in that regard contracts an inflammable disposition.

For it is obvious to every person, that the blood that grows clammy in this manner, is rendered prone to obstruct the narrow passages of the vessels (which surely are very small in the Lungs); moreover for the same reason they are disposed to become feverish: viz. because retaining obstinately within its own bosom all the feculencies and recrements, from the same presently gathered into a heap, it is constrained into a great turgescence or swelling, whereby of necessity an inflaming obstruction of the Lungs takes either its origine or augmentation.

Moreover as to the procatactic cause of this disease, very frequently the faultiness of the Lungs is joined herewith, and determines that general intemperament of blood to affect this part in such a sort. For as the clammy blood grows hot, the more strong and sound *Præcordia* do frequently discharge the designed mischief from themselves, and the taint being fixed to the Pleura, or about the habit of the body, a Pleurisie or Rheumatism is rather caused than a Peripneumony. Nevertheless the tender Lungs being obnoxious to a Cough, or formerly prejudiced in their frame either by spitting blood, or other distempers of the breast, from the blood boiling up (while it is too much bound and clammy in its own consistence) they easily engender an obstructing Phlegmon.

The fault of the Lungs produces it.

Hitherto of the conjunct and procatactic causes of a Peripneumony: as for what regards the evident causes, whatsoever suddenly perverts the temperament of the blood, or restrains its free transpiration ought to be referred hither, as chiefly are excesses of heat and cold, or the inordinate drinking of Wine or strong Waters, any vehement exercise, and the drinking of some waters, and those especially icy. Besides, sometimes a malignant distemperature of Air doth engender this disease in many, and makes it Epidemical.

The evident causes of a Peripneumony.

Authors in Physick do every where observe (and it is also a vulgar observation) a Peripneumony frequently succeeds or comes upon a Pleurisie; but nothing is more usual than in a Pleurisie a bloody and thick spittle, and as it were purulent to be voided. Hence a great disquisition arises, by what passage or ways the matter by spittle cast out, can be conveyed from the Pleura to the Tracheal passages. Some think, that this being fallen into the cavity of *Thorax*, is sucked into the Lungs as with a Sponge; and others suppose, that it is transferred thither by the Membranes adhering thereto, by which the Lungs often stick unto the Pleura. But truly either way seems improbable, if not impossible. For first, that the Lungs do not suck in the contents of the hollownes of the Chest is manifest from hence, because in a Dropsie or wound of the breast, when they happen, the Lungs being unhurt, neither water nor blood is at all discharged by coughing; though frequently great plenty of this or that humor be there, which presently flows out of its own accord from the *Thorax*, incision being made. But that sometimes the Membranes growing from the Lungs, knit themselves to the Pleura, is clearly manifest by Anatomical observation; yea and by this way of return I have sometimes known the purulent matter translated into the side, and there by an Issue, made by Art or Nature, to have been evacuated with a heathful Crisis: nevertheless such Membranes of the Lungs joined to the Pleura do seldom pre-exist, and in a Pleurisie, which is a very acute disease, they cannot, like a Mushroom, be the issue of one or two days: moreover, though sometimes those obscure passages may be ready at hand, which perhaps by some admirable instinct of Nature discharge something out of the Lungs towards the precincts of the *Thorax*; yet it seems against the Oeconomy of Nature, that they can derive any corruption outwardly engendered to this most noble part within, which surely is the fountain both of life and heat.

It often succeeds or follows after a Pleurisie.

As to this, if it may be lawful to propound our Judgment, I am induced to think that a Peripneumony and Pleurisie are one while singular and separate affects, and another while bred together and coexisting from the first, and another while are by course one after another or succedaneous. For the procuring cause being stirred up into act, so that the blood growing clammy, and boiling together, obstructs in some places the lesser vessels: the nest of the disease sometimes is fastned on the Pleura, or separately in the Lungs, sometimes in each of them together, and sometimes first in one, and then in t'other: but for the most part, the Pleura being first healed, presently the

The reason of this is inquired into.

same

same morbid cause invades also the pneumonic Vessels. Moreover we have known a various shifting of this affect; viz. that it has first troubled the right or left side, presently that being deserted, to have occupied the Lungs, and afterwards both being deserted, to affect the Brain, and frequently to transfer its seat from thence into the above-mentioned places. But for the reason aforesaid a Peripneumony not only succeeds a Pleurisie, but frequently a Squinancy, and sometimes other distempers: for while the blood growing clammy, and boiling together, continues a Fever in the whole, it transfers the obstruction causing a Phlegmon variously hither and thither. And from hence the solution of that observation is clearly manifest, which has so much puzzled Interpreters, viz. that a Palsie or dead Palsie of one side doth sometimes succeed a Peripneumony, because the blood that being clammy, had lately obstructed the pneumonic Vessels, afterwards stuffing certain foldings of the vessels of the Carotides, prohibits the engendring of animal spirits in this or that part of the head, and so restrains their influence into the respective nervous parts. From what hath been said, the chief differences of a Peripneumony are made plain, namely that it is either a simple distemper, or joined together with a Pleurisie, Squinancy, or some other, and then it is either primary or secondary. Moreover it is usually distinguished as to the Fever and state of breathing: to wit, according as this is more or less prejudiced, and as it shall be more intense or remiss, this disease also is denominated either more or less acute.

*The differences
of this disease.*

Prognostics.

As to the Prognostics of this disease, common experience doth attest, that it is a very dangerous disease, because many Patients either die of it, or very difficultly recover health. No less may we conclude this from the reason or Etiology of it; for a wound with much extravasation of blood, or a stagnation caused in the Lungs, is most difficultly cured, and the affected place is never restored unto its former conformation. The prognostic signs, which are of greatest note, are taken from the appearance of Symptoms and nature of things thrown out, and the state of strength.

1. From the appearance of Symptoms.

1. A Peripneumony coming upon a Pleurisie or Quinzy, for the most part is worse than arising of it self, or succeeding either of them: but if upon this disease, after what manner soever begun, an acute Fever follows with great thirst, watchings, and not breathing unless set upright, it is ill; and yet much worse, if upon it a Delirium, a Frenzy, convulsive motions, or a Palsie on one side ensue. Moreover the Patient is not in less danger, if he be very pulse, if troubled with vomiting, or frequent swooning away, a weak Pulse, and a cold Sweat. For while these Symptoms are instant upon him, the obstruction of the blood in the Lungs is not removed, nothing is digested or ejected by spittle; but the circulation of the blood being more and more hindered, and its kindling by breathing stopt, the animal spirits are thoroughly disordered, and at length faint, until together with a prostration of the whole strength the vital flame is extinguished.

2. From what is excreted.

2. As to Prognostics from things excreted, we observe a Peripneumony to be dangerous, wherein nothing is thrown out by spittle; next to this, when the spittle is thin and crude, mixed with blood; it is far better when the spitting is yellow and thick, streaked with a little blood. The Urine being yellow from the beginning, and of a good consistency, with a cloud in the midst, shews that almost all the recrements of the blood are lodged in the place affected; when from that state it is changed into a thick and turbid Urine, it shews the morbid matter to be swallowed up again from that part into the blood; but if such kind of Urine be suddenly changed into a thin one, then a Delirium or death it self is impendent. Much Sweat and plenty of Urine, a Diarrhoea, bleeding at Nose, flowing of the Menstrua's, or the Hemorrhoids do frequently promise good in this distemper, yea any of these Evacuations happening seasonably doth frequently discharge the disease.

3. From the state of strength.

3. The condition of strength is ever of great moment in forming a due Prognostic in this disease: for oftentimes when horrid Symptoms, as an intense Fever, a Breathing very painful, with a Cough, watchings, and other ominous signs, shall be pressing, if the Pulse be as yet strong, and the animal spirits persist in their vigor, there is better hope of the Patient, than if these things being more quiet, there were a weak Pulse, and the Spirits should become drowsie and oppressed.

The cure hath two chief indications.

The first indication about the curatory Method in a Peripneumony is, that the blood being impacted in the pneumonic Vessels, and causing a phlegmonous obstruction, may be from thence dissolved and restored to its pristine circulation. Which if not to be procured, the second indication will be, that that matter be duly digested or brought

to

to suppuration, and with all expedition voided by spittle.

While the former indication prevails, the intentions of healing will be these ensuing. First, that the more plentiful afflux of blood to the part affected be prevented, or prohibited by some means. Secondly, we must endeavour, that the matter stagnated or extravasated in the Lungs, be swallowed again by the Veins into the rest of the mass, and caused to circulate. Which that it may be the better procured, thirdly, the blood ought to be freed from its clammy viscoseness, whereby its fluidity is impeded. Fourthly, that we apply to the Symptoms most urgent, viz. a Fever, Cough, Watchings, and difficult Breathing, fit Remedies. But if notwithstanding all these another indication shall come into use, it will be requisite to prescribe maturing and expectorating Medicines vulgarly so called, together with these.

The first indication suggests four intentions of curing.

1. That we may satisfy the first and second intention together, Phlebotomy is for the most part requisite in every Peripneumony, yea sometimes it ought to be more frequently repeated; for the vessels being emptied of blood do not only withdraw the nourishment of the disease, but do also sup up the matter impacted in the place affected. Wherefore if strength remain, and the Pulse be strong enough, a more free breathing of a Vein is convenient at the very beginning; but otherwise let it be used in a little quantity, which however may be repeated as occasion offers it self. We intimated above, that blood drawn in a Peripneumony and also in a Pleurisie, after it is cold, contains in its superficies a small viscous and discoloured film: moreover we may observe one while the blood entirely, another while only a portion thereof is subject to this change. For when the blood is received into three or four dishes, sometimes in all, but oftener in the second and third dish it is apparently bad, and in the first and last laudable enough: wherefore they commonly give it in precept, that blood is always so long to be emitted, till that which is so depraved begins to come forth; and if strength remain, the bleeding should continue till the good blood flows out again. Truly as common experience doth approve of this practice, even so doth reason it self; for in this disease, because the whole mass of blood doth not presently acquire that clamminess, the depraved portions are chiefly accumulated about the place of obstruction, and adhere on every side in the lesser vessels. Wherefore the blood first issuing by Phlebotomy is often void of any fault; afterwards the vessels being emptied receive the other morbid matter at first stagnated, and restore it to its circulation; and when the portions thereof being placed near, are carried as it were in a joint troop, they flow out together at the orifice of the opened Vein, and after that entire mass of bad blood hath flowed out, the residue being more pure doth succeed. Wherefore in this case ever let incision be made with a large orifice, and let the blood be drawn out not only with a more plentiful spouting, but also with a continued: for otherwise if in the midst of Phlebotomy, the bad blood issuing out, the orifice (as the manner of some is, lest the spirits should faint) be closed with the finger, when again it is opened, the blood pure enough will issue next, but the bad sliding by, if there be any remaining, will not return presently to that orifice. Besides Phlebotomy many other remedies, viz. whatsoever do repress the turgency of blood, and empty the passages thereof, whereby the morbid matter may be sucked up, are here to be used. Wherefore a very thin diet is prescribed for the most part merely of Barley and Oats: and if Cathartics are altogether prohibited, because they disquiet the blood, and hurry it more impetuously into the part affected; notwithstanding Clysters which gently loosen the Belly, and draw the recrements of the blood towards the Belly, ought to be daily used. Moreover Juleps and temperating Apozemes which bridle the fervor of the blood, and draw out the superfluous serosities thereof, and which also do gently open the passages of the Breast, are taken with success.

1. The first intention that the afflux of blood may be cut off.
2. That the extravasated be reduced to circulation.

Rules concerning Phlebotomy.

3. The third intention of healing, which respects the withdrawing of the clamminess or obstructing viscosity of the blood, is altogether to be performed by remedies which unloose the frame thereof being too much bound, and dissolve the coupling together of its salts. And truly the remedies of this kind, which in this respect reason and analogy would dictate, are now received into use by long experience. For Powders of Shell-fish, the Tooth of a Boar, and the Jaws of a Pike, and other things endued with an Alkali Salt, also Sal Prunellæ, for the most part are prescribed by all Practitioners, as well modern as ancient. I have more frequently known the Spirit of Salt Armoniac and of Harts-horn to have yielded notable relief in this disease: and for the same reason it is, (viz. because the volatile Salt is useful) that the infusion of Horse-dung, though a common remedy, affords oftentimes singular help.

The third intention of healing is that the clamminess or viscosity of the blood may be taken away.

4. As

4. That the most winging Symptoms may be helpt.

4. As to the Symptoms and their Cure, very many remedies appropriated to these fall in together with the former; for against the Fever the same Juileps and Apozems which appease the heat of blood, and withal recreate the animal spirits are of most common use: to which besides in respect of the Cough and difficult breathing, temperate pectoral Remedies are added. The great difficulty is what ought to be exhibited against want of sleep, when it shall grievously oppress; for Opiates, because they do further prejudice the breathing, which in this disease is already hindered, are scarce safely administered, nay sometimes become mortal. Wherefore Laudanum and the strong Preparations of Opium are to be shun'd in a Peripneumony worse than a Dog or a Snake; nevertheless Anodynes sometimes, and mild Hypnotics, as water and Syrup of red Poppies, are not only allowed, but accounted specific remedies in this disease and in a Pleurisy: but sometimes it will be expedient to use Diacodiates as long as strength endures, and as long as the Pulse is strong and good enough. For the pain of the breast, if at any time it be troublesome, it is expedient sometimes to apply Liniments, Fomentations, and Cataplasms.

The second indication respects the maturation and expectoration of the morbid matter.

The second curative indication, whose intentions are to digest the matter impacted in the Lungs (if it cannot be dissolved or sucked up) and to throw it out by spittle, requires ordinary maturating and expectorating Medicines, both which notwithstanding ought to be temperate, that is to say, such as allay thirst, and appease the feverish heat rather than exasperate it. We have above recited in the Chapter of a Cough, the kinds of these sorts of Remedies properly called Pectorals; the more select Receipts, and chiefly accommodated to this affect, shall be annexed here beneath.

The Forms of Remedies.

1, 2. The Medicines conducing to the first and second intention are prescribed according to the following Forms.

Juleps.

Take the water of Carduus Maria ten ounces, red Poppies three ounces, Syrup of the same an ounce, Pearls prepared a dram, make a Julep: the dose six spoonfuls every fourth hour.

Take water of black Cherries, Carduus benedictus, Balm, each four ounces; powder of a Boar's tooth a dram, Syrup of Violets ten drams: make it into a Julep to be taken after the same manner.

Apozemes.

Take Grass roots three ounces, shavings of Ivory and Harts-horn each three drams, Raisins stoned an ounce and half, Liquorish two drams, boil them in Spring water from three pints to two, to the strained liquor add Syrup of Violets an ounce, Sal prunella a dram: make an Apozem to be taken thrice a day about three or four ounces.

Purgation.

For the same intention, viz. that the Vessels being emptied may withdraw the nourishment from the disease, or sup up the morbid matter, a Purge is prescribed by many. In the Practice of the Ancients against this disease, even as against many others, after Phlebotomy, Preparatives and Purgatives were usually appointed in a constant course, and of late the Chymists with greater boldness do recommend Vomits, and in a Peripneumony prefer it to all other remedies. Yea Phlebotomy being omitted or countermanded, they place the chief Cure in stibiate Vomits: than which rash advice of theirs I know not any thing may be thought of more pernicious. Indeed in rustic and robust bodies sometimes this Cure has been effected without danger, notwithstanding for the most part no less unsuccessful; but in tender constitutions it ought to be reckoned little inferior to poyson. But for what respects Purgation, although it may not be presently convenient from the beginning, because it is then for the most part prejudicial, nevertheless the flowing of the morbid matter being finished, and the effervescency of blood being appeased, we may safely and gently evacuate the body with a loosning Purge.

Purges.

Take of the decoction of Senna of Gereon four ounces, Syrup of Roses solutive an ounce: mix them for a Potion. Or,

Take the best Senna three drams, Cassia and Tamarinds each half an ounce, Coriander-seed two drams: boil them in a sufficient quantity of Spring-water to six ounces, to which strained add Syrup of Violets an ounce, clarified with the white of an Egg, and let it be given.

Purgatives are not always to be exhibited, nor ever unadvisedly in this disease: but frequent Clysters, and almost daily are in use; but let them be gentle and emollient only,

only, which easily loosen the belly, without any great agitation of humours or blood. For this purpose Milk or the Whey thereof is often convenient, with red Sugar, or syrup of Violets: Or, Take the leaves of either sort of Mallows, of Melilot, of Mercury, of each one handfull, Linseed and sweet Fennel-seeds, of each half an ounce, sweet Prunes, numb. vi. boyl them in a sufficient quantity of Spring-water to a pinte, to which adde syrup of Violets one ounce, Sugar ten drams, sal Prunella one dram, make a Clyster.

3. Medicines for the third intention, viz. for the dissolving the Clamminess of the Blood, are wont to be administred in form of a Powder, of a Spirit, a Potion, or of a Bolus, according to the mannaer following.

Things dissolving the clamminess of the blood.

1. Powders.

Take of Crabs eyes two drams, sal Prunella one dram and half, pearl'd Sugar one dram, make a powder for 6 doses, one to be taken every sixth hour, with a proper Julep or Apozeme. Or,

Take of the Tusk of a Boar, (or the Jaw of a Pike) of Crabs-eyes, of each one dram and half, flowers of Salt Armoniack, Powder of red Poppy Flowers, of each half a dram, mix them for 4. doses.

2. Spirits and Chymical Liquors.

Take of spirit of salt Armoniack distill'd with Olibanum, 3 drams; the dose from 12 Spirits drops to 15 or 20, three times in a day. Or,

Take Spirit of Urine or Soote, after the same manner, three drams.

Take of the sweet Spirit of Nitre, (viz. often cohobated with Spirit of Wine,) 3 drams, the dose from 6 drops to ten after the same manner.

Take half an ounce of Spirit of Tartar, dose 15 drops to 20 or 25, in a fit vehicle.

Take of the simple mixture one ounce: the dose is one scruple to half a dram, after the same manner.

3. Potions.

Take of Carduus-water one pound, fresh Horse-dung 3 ounces, dissolve it warm, and filtre it; the dose is 3 or 4 ounces, twice or thrice in a day, with half an ounce of Syrup of Violets or red Poppyes.

Take of the Leaves of Dandelion two handfulls, bruised and infused in half a pound of Carduus Maria water, Treacle-water half an ounce, press it out, and adde powder of Crabs-eyes one dram: take 4 or 6 spoon-fuls three times a day.

The fourth intention of Healing in respect of the symptomes greatly urging, doth suggest divers sorts of preparations of Medicines. 1. In respect of the Feaver, the Juleps and Apozemes above recited are convenient. Moreover, the use of Mineral Crystal ought to be frequent. 2. For the Cough and difficult Breathings, Linctus's, Eclegma's, and Decoctions, or pectoral Juleps are administred with successe.

The cure of the Symptomes.

Take of Syrup of Fijubes, of Maiden-hair, of each one ounce and half, of Violets Linctus's one ounce, flowre of Nitre one scruple; make a Linctus to be lickt now and then.

Take of Syrup of Marsh-mallows one ounce, Diacodium, red Poppyes, each half an ounce, powder of Crabs-eyes two scruples; make a Lohoch, to be taken the same way.

Take Syrup of Hyssop, of Liquorish, of each one ounce and half, red Poppy-flowers powder'd one scruple, Crabs-eyes one dram, Lohoch de Pino 6 drams, make a Lohoch, take the quantity of a Nutmeg four times or ofner in a day.

Take the roots of Gras, Chervil, Marsh-mallows, of each one ounce, Figs numb 4. Fijubes and Sebestens, of each numb 6, Raisins one ounce, Liquorish three drams, Barly half an ounce, boyl them in three pints of Spring-water to two, strayn it; the Dose three or four ounces.

An Apozeme.

Take Raisins stoned one ounce and half, Filberds numb 4. cut, Liquorish sliced 3 drams, of Hyssop-water a pound and half, infuse them warm in a closed Vessel 6 hours, strain, and adde Syrup of Marsh-mallows one ounce and half; make a Julep, the dose is 3 or 4 spoon-fuls often in a day, swallowing it by degrees.

Against Watch-
ings.

3ly, Against Watchings, Take Poppy-water 3 ounces, Syr. of red Poppies 6 drams, Aq. Epidemica 2 drams, for a draught, to be taken at night.

If the Pulse be strong, and the strength agreeable, Take Cowslip-water 3 ounces, Syrup de Meconio half an ounce, for a draught at night.

For Pain.

4. If the pain be troublesome about the place affected, Take Oyntment of Marsh-mallows two ounces, Oyl of sweet Almonds an ounce and half, mingle them for a Liniment to be applied with thin Lawn-paper.

Take of Oyntment of Marsh-mallows and pectoral Oyntment, of each an ounce and half, Linseed Oyle fresh drawn one dram, to which adde the Plaister call'd Emp. de Mucilaginis, make a Plaister for the Region of the breast, to be applied on the place affected.

Fifthly, For the last intention of curing which answers to the secondary Indication, and prescribes Medicines ripening and expectorating, the following forms are convenient.

Maturing
medicines.

Take Linseed Oyl fresh drawn three ounces, Syrup of Violets two ounces, Hyssop-water half a pound, mixe them in a Glasi, take two or three ounces three times in a day, shaking the Glasi first.

Take powder of Olibanum one dram, put it into an Apple made hollow, and roast it in hot Embers, let him eat it at night, repeating it three or four times.

Expectorating
Medicines.

Take Oyl of Almonds fresh drawn, Syrup of Maiden-hair, of each an ounce and half, Sugar-Candy two drams, stirre them well in a Glasi-mortar untill they are perfectly mixt, make a Linctus to be taken often in a day with a Liquorish stick; also let a spoonfull be taken three times a day in a draught of Posset-drink.

As to the rest, Remedies prescribed against a beginning Consumption do also profit in this case.

The first History.

It would be easie to heap up here many Histories and Instances of Patients affected with a Peripneumonie; but whereas the same order and figure of the disease, and the same reasons of the Symptoms are almost in all, it suffices here to note one or two Examples only. And while I was writing these things I am sent for to a Patient grievously sick with a Peripneumonie. He was aged about Fifty years, lean in body, and of a cholerick temper, by taking cold he fell into a Feaver, with a Cough, with pain of the Breast, and difficult breathing: when he had laboured thus four dayes without any remedy or physical administration, I found him in a notable Feaver, with thirst, and a huge inflammation of the Precordia, breathing very difficultly, with labour of the Thorax, and painfully, with a noise of the Bronchia, insomuch that he seemed evidently in the very Agony of death. His Pulse being strong enough (although quick and disturbed) I immediately prescribed Phlebotomy, to eight or ten ounces, by which when he received a little relief, after three hours intermission, a Clyster being first administered, I ordered him to repeat his bleeding to twelve ounces: Moreover, I ordered Spirit of Harts-horn to be given twelve drops every sixth hour, with an appropriate Julep, and in the distance between I ordered a dose of the following Powder to be administered:

Take powder of Crabs-eyes, sal Primella, of each one dram and half, Pearles a dram, Sugar-Candy two scruples; make a powder to be divided into 8 doses.

Moreover, he took as often as he pleased a draught of a pectoral Apozeme. By the use of these within three hours all the symptoms began to abate, and the night following he sweat, and slept a little; the day after I repeated Phlebotomy, and after continuing the same Remedies in four or five dayes he intirely recovered his health. The blood we took from him was alwayes in the Superficies viscous and discoloured.

The second History.

A certain Gentleman of a sanguine Complexion and a strong habit of body, after an immoderate drinking of Wine contracted a Feaver, with a most painful Peripneumonie, insomuch that thirst and heat mightily pressing him, sitting always upright in his bed or Chair, and breathing short and very frequent, he could scarcely, yea almost not at all suck in air enough to sustain the vital flame. Because he could not undergoe a large Phlebotomy, I drew blood twice or thrice day after day; frequent Clysters were administered: Moreover, Apozemes, Juleps, also Spirit of Armoniack, and powder

powders of Fish-shells were administred by turns. Within four or five dayes the Feaver somewhat abated, also he began to breathe better, and sometimes to take short sleeps, yet he did always complain of a notable heaviness of his breast, and intolerable oppression of the Lungs; wherefore, when Phlebotomy was no longer safe, I applyed very large Vesicatories to his Arms and Thighs, the blisters in his arms dry'd up in a short space, but those on his legs did not only remain open, but after five or six days did run hugely, and afterwards almost for a month daily discharged great plenty of a most sharp ichor; in the mean time his lungs sensibly amended, and at length were delivered from all their burden; lastly, the little sores raised by the Vesicatories very painfully and not without frequent Medicines could be cured.

SECT. I. CHAP. IX.

Of a Pleurisie.

HOW great affinity there is between a Pleurisie and Peripneumonie, we have hinted before; viz. although either distemper is sometimes solitary, and exists separately from the other, yet they often happen together, or one while this, another while that, come one upon the other, or succeeds it. The foregoing cause is the same of both, viz. a disposition of the blood to be clammy and boyl up withall; also, the conjunct cause is the same, viz. an obstructing Phlegmon in some part of the lesser Vessels, by reason of such a disposition of blood. Moreover, the same method of Cure is prescribed by most modern Physicians for either disease: The chief reason of the difference whereby they are distinguished one from the other, is taken from the places affected, which their Names denote. For the blood predisposed to the enkindling in some place an enflaming obstruction, therefore often plants the nest of the disease in the breast, because here it burns out more hideously, by reason of the Hearth of vital fire; and also is not freed from the vaporous Effluvia and other Recrements which hinder Circulation. To all which there ensues, that in this Region, the mass of blood being shut up, and not able to pass through the more strait Conveyances; is not as in the bowels of the lower Belly, opened with any ferment, or new washt with any watery juice: wherefore, if perhaps the blood, carried through the vertebral Arteries into the membrane encompassing the ribs, shall stick in its passage, about the narrowness of the Vessels or inter-spaces, the Distemper of which we now treat succeeds: In like manner, if an obstruction happen within the passages of the Lungs, a Peripneumonie will ensue, as we have declared before. Wherefore, according to the Pathologie of this disease before delivered, those things which belong to the Theory of a Pleurisie, as well as the Curatory method, may with small labour be designed.

The diseases of a Pleurisie and Peripneumonie are akin.

How they differ betwixt themselves.

Both the sense of pain, as well as Anatomical Observations taken from the Patients dead of a Pleurisie do plainly attest, the seat of this Disease (as often as it exists primarily and solitarily) consists in the Pleura or Membrane environing the inside of the ribs. And a true and singular Pleurisie is an inflammation of the Pleura it self, from the abundant flowing in of inflamed blood, growing clammy withall, taking its motion through the vertebral Arteries, with a continual and acute Feaver, a pricking pain of the side, a Cough and difficulty of breathing.

The seat of a Pleurisie.

The next Cause is the blood obstructed by reason of its clamminess in the lesser vessels; and interspaces of that membrane (in like manner as it is in a Peripneumonie) or being extravasated, being heaped in the same place more plentifully, by reason of the swelling up, for that cause exciting an inflammation. An acute pain ariseth upon this, by a wound in a part highly sensible; also there ariseth a Cough by reason of a provocation giving impresson to the intercostal muscles; moreover a difficult breathing by reason of the muscular fibres being hurt as to their action; which because they cannot perform long and strong contractions, they are constrained to undergoe weak although more frequent Contractions: otherwise than in a Peripneumonie, in which that symptome ariseth from a Lung too much fill'd and stuffed. The Feaver is caus'd from effervescence of blood, and is for the most part rather the associate than the effect

The next cause of it.

fect of a Pleurisie. For the blood from what cause soever driven into a feaverish turgescency, if it be bound up together in its mass, will be apt to grow clammy, which together with the Feaver most often induces a Pleurisie or a Peripneumonie, or both of them. From hence we may observe this disease doth frequently vary its kind, and change its place; viz. from a Pleurisie into a Peripneumonie, and on the contrary; afterwards it passes from both or either into a Frenzy or a Squinancy: for that the blood while it is boyling throws off its viscous recrements one while in this part, another while in that, another while in more together, and lastly it re-assumes them again, and variously transferrs them.

The more remote causes of this Disease.

The more remote causes of a Pleurisie are the same as of a Peripneumonie, viz. whatsoever stirs up the blood, predisposed to grow clammy and also to boyl up, and provokes a feaverish turgescency. Hither appertains excess of heat and cold, a sudden constipation of the pores, surfeit, drinking of Wines or Strong-waters, immoderate exercise; sometimes the malignant constitution of the Air brings this disease almost on every body, and renders it Epidemical: whereto may be added, that this disease is very familiar to some from their constitution or custome; so that a distemperature of blood, induced almost by any occasion, immediately passes into a Pleurisie.

From what we have already said, the signs of this disease do appear manifest enough, by which it is well known as to its Essence, and is distinguished from other diseases, and especially from a Bastard Pleurisie and a Peripneumonie. But it is to be observed that a pain in the side arises sometimes very troublesome, which while it counterfeits a Pleurisie, is sometimes taken for it, although falsely. For in some persons obnoxious to the Scurvy, and the affects of the nervous kinde, sometimes it happens that a sharp humour, and very painful descends into the Pleura or intercostal Muscles, and being fixt there produces most fierce tortures; which distemper is yet discriminated from the Pleurisie, inasmuch as it is void both of Feaver and Thirst, the Pulse always abides moderate and laudable, frequently the appetite and strength endure; moreover, the pain is not long fixed or limited to one place, but sensibly creeps hither and thither into the neighbouring parts, as the matter slides down through the passages of the fibres, out of one place into another.

The differences of it.

We meet not with many differences of this disease; notwithstanding it is used to be distinguished, viz. to be either true and exquisite even as we have now described, or spurious, which having its seat in the intercostal muscles, or their interspaces, proceeds from winde, or a ferous and sharp humour heaped up in the same place, and raises a pain less sharp, without so much as an inflammation or feaver: And whereas the grief is planted externally, the Patient for the most part lyes better on the opposite side, otherwise than in a true Pleurisie. Secondly, a Pleurisie is either single, or complicated with a Peripneumonie or some other distemper, and so it is either primary, or secondary, or join'd with some other affection.

The Prognosticks.

As to the Prognosticks of this disease, Hippocrates hath observed many certain tokens whereby a good or evil event is signified to patients sick of the Pleurisie. To run through each of these, and to unfold them with Commentaries added to them, we have neither leisure, nor doth it seem worth our endeavours. The chief thing of all in a Pleurisie, is, that the disease be presently dispatch'd, partly with a free and frequent bleeding, and partly by a Critical Sweat, arising about the fourth day, or before the eighth; or these things not duely succeeding, it will be prolonged, and then most frequently a Peripneumonie or Empyema, or a collection of corrupt matter between the Breast and Lungs, or both distempers do arise upon this disease; from which there follows a solution of the disease but slow and incertain, and most frequently full of dangerous chances.

A Peripneumonie coming upon a Pleurisie not presently cured (as it is often wont to be) all our hope is placed in digelling maturely the Spittle and quick Expectoration thereof: for if this be laudable and plentiful, and easily and hastily thrown off, it doth often finish both diseases intirely. Notwithstanding, it is not therefore a consequent that the matter of a Pleurisie is derived from the side into the Lungs by I know not what blinde passages, or that the same being sweat out of the Pleura into the cavity of the breast is imbibed by the Lungs, and at length drawn upwards through the passages, and excern'd forth. But when a Peripneumonie arises on a Pleurisie, and the matter impacted in the Lungs begins to be evacuated by Spittle, so that the affected places of the Lungs are continually emptied; the blood resumes the

the other matter fixed in the Pleura, and carries it to the Lungs where the places of conveyance are open, to be ejected by Spitting. But if the Pleurisie be cured neither by it self, nor associating with a Peripneumonie, then at length either by an Imposthume made in the Pleura or in the Lungs, an Empyema or corruption between the Breast and Lungs succeeds; or all the matter being brought into the Lungs and there putrified, loosning the unity of the Viscera, it propagates a mortal or scarce curable Consumption.

As to the cure of a Pleurisie, forasmuch as the state of this Disease, the Crisis and tendencies are manifold, divers curatory Indications offer themselves according to their various regards; and as occasion serves, according to the advice of a prudent Physician, they ought to be appointed in the beginning, and sometimes altered or continued. For surely one Method is convenient for a solitary and simple Pleurisie, and another if it be complicated with a Peripneumonie: Besides it behoveth to ordain another and another if perhaps a Crisis be expected by Spitting, or matters growing worse, the disease is either passing into an Empyema, or tends to a Consumption. As to the three later cases, that is to say, when a Pleurisie commencing, passes into a Peripneumonie or Empyema, or lastly into a consumptive disposition, there is designed an appropriate way of curing in the pathologies of each of these diseases particularly delivered. But as to what appertains to our present purpose, three Indications offer themselves for a primary and simple Pleurisie, and they are curatory, preservatory and vital.

The Cure thereof.

I. The first Indication takes care that the Inflammation or obstruction of blood in the Lungs by all manner of means with all expedition be removed; for which intent phlebotomie in every Age by all physicians (excepting some Fanatick or false Chymists) is wont to be prescribed, as a principal remedie: The reason of which is altogether the same as in a Peripneumonie and many other distempers, caused by reason of a stop of blood in some place, and so an accumulation: Because that the vessels bringing blood being much emptied, do not only rescind the nourishment of the disease, but drink up the matter which is the conjunct cause thereof, and convey it to another place. Wherefore blood is to be freely drawn away in a Pleurisie, if the strength endure it, and the Pulse be strong. And surely it is far better that the first time and every time after (as often as there is need to repeat it) blood be more largely emitted, than to do it more often and more sparingly. For very many portions of the blood growing clammy and degenerating into viscosities, are heaped up about the place affected; which, unless they are call'd away from thence by emptying the Vessels through large phlebotomie, and in a great part let forth, the letting of blood will be frustrated of its desired effect. Wherefore, that Physicians prescribe blood in a Pleurisie to be drawn out even to swooning, seems not incongruous to reason, although that practice is not rashly to be attempted, for that every evacuation ought to be proportioned to the tenour and tolerance of the strength, which rule such a phlebotomy doth exceed.

The first Indication.

Phlebotomia necessary almost in all Pleurisies.

But though there is almost a general consent of all Physicians to breath a vein in a Pleurisie, notwithstanding there was ever an earnest contention about the place, what Vein ought to be opened. Hippocrates and Galen opened a Vein on the same side of the patient; afterwards the Arabians and their followers the Italians, and French, did either open the *Saphene* or the *Basilica* of the opposite side, damning the phlebotomy of the same side by Bell, Book and Candle. Yet in the later generation, the practice of the Ancient Greeks by little and little revived, so that some did dare to make incision on the same side; yet always one side judged the others of the opposite persuasion as it were guilty of murder, as often as any unlucky event did happen. So that while among Physicians about phlebotomy there was no less a contention than among the Jews and Samaritans about the Sacred place of Worship, at length the Doctrine of the Circulation of the Blood held out like a new Light by the most renowned Harvey, discuss'd all the clouds of this Controversie; so that immediately it clearly appeared to be almost the same thing, whether incision be made in the Vein on the affected or opposite side of a patient sick of a pleurisie; although in our Age Custom hath prevailed first and rather to open the Vein of the affected side. Notwithstanding a Vein being opened in either Arm draws nothing at all immediately from the vertebral Arterie or from the pleura; they are only the branches of the Azygos, or of the vertebral vein that receive the blood out of the place affected: but that they may accomplish this, they are not unloaded in any other manner, but

What Vein is to be opened in a Pleurisie.

Various opinions are recited.

that

that the quantity of the whole blood be abated by phlebotomie wheresoever made. Onely this may be affirmed for opening rather the vein of the affected side, that the Basilick vein being unloaded, the Arteries of the Arm receive the more ample provision of blood; from hence the bloody stream of the vein Aorta runs down more swiftly from that side towards the branches of the Arm, and perhaps in the interim of its quick passage it infuses less blood into the vertebral Arteries, for the nourishment of the disease. As to that opinion, that the blood is sometimes more plentifully carried from place to place, that from hence the right Lung or Liver being beset with an inflammation or obstruction, the right part of the head is in pain, and of the face grows more red; I say this sometimes is brought to pass, because the patients do constantly lie in their bed on the side affected; wherefore, the Vessels being compress'd, the blood stays longer in other parts of the same side while it is circulating. But of these things we will make a more diligent search when we shall render the History and Etiologie of phlebotomy.

Cupping-glasses with Scarification supply the place of blood-letting.

whether Purges and Vomits are to be taken in a Pleurisie.

What other kind of Remedies are convenient in this disease.

The second Indication preservative.

The third Indication vital.

But if phlebotomy by reason of a weak pulse, and fainting of the animal function, neither ought to be at first administred, nor repeated, though the pain be most urging; Cupping-glasses with Scarification do well supply the turn hereof, being applied to the place pained. *Riverius*, and *Zacutus Lusitanus* have cited notable Examples of cures effected by this remedy. And surely this practice seems to lean upon a reason strong enough; for the blood being drawn away from the side affected, that which is lodged in the neighbouring vessels, being the conjunct cause of this disease, is moved with it, and partly drawn away, and partly turned to its Circulation. Moreover, to remove an inflammation of the Pleura, besides withdrawing blood by a free Phlebotomy or Scarification, also the serous and other excrementitious humours ought to be gently solicited and excerned as well out of the mass thereof, as out of the bowels, by Stool, Urine and Sweat. The more strong purgatives are deservedly prohibited, because they disquiet the blood, and constrain it to be impacted more deep into the places affected. And that certain renowned Chymists, viz. *Angelus Sala*, *Hartman*, *M. Rulandus*, with many others, do audaciously exhibit Vomits of Stybium to any afflicted with a Pleurisie, and magnifie it for the best remedy, seems to me neither safe nor congruous to reason; the only reason of helping, as I think, and that very uncertain, and full of danger, may be, viz. that the medicine operating more vehemently while the patients suffer exolution of spirits or swoonings, all the vigour and turgescence of the blood abates, and for that cause the nervous Fibres remit their wrinklings or painfull contractions, and the Vessels carrying blood being much emptied, do suck up the morbidick matter: In the mean time, there is danger lest the humours being violently disturbed, rush more impetuously to the part affected; at least, lest the Spirits being too much dejected, and the work of Nature disquieted about the digesting or separation of the morbidick mater, strength should utterly fail, before the disease be cured. Yet in the mean time, Clysters are of frequent or daily use: yea sometimes more benigne solutive purgatives are allowed, provided that the Fever be not very intense. Julips and temperating Decoctions and things gently moving Sweat and Urine, as we have prescribed before for a Peripneumonie, are also here convenient; but let all hot and sharp things, whether aromatick, or endowed with a vinous spirit be carefully declined.

II. The second Indication preservative, designed against the clamminess and boiling up of the blood, prescribes Medicines of that sort which consisting of a volatile or alcalized Salt, do destroy the combinations entered into, of the acid and fixed or otherwise distempered Salts, with the other more thick particles. For which intent the eyes or claws of Crabs, the tooth of a Boar, the Stone of Carps, the jaw of a Pike Fish, the Bone in the heart of a Stag, the Priapus of a Hart, Sal Prunella, Salt of Coral, Salt of Urine, or volatile salt of Harts-horn, powder of Goats-blood, infusion of Horse-dung, Spirit of Harts-horn, of salt Armoniack, Spirit of Tartar, the simple mixture, mineral Bezoar, Diaphoretick Antimony, flowers of salt Armoniack, are very famous Remedies in a Pleurisie.

III. The third Indication vital which provides that the strength and vital heat be preserved during the course of the Disease in due tune and state, gives in precept first an apt kind of food, and moreover Cardiac and Anodyne remedies, and those which seasonably occur to other symptoms, if perhaps they arise. First, in a true Pleurisie, a most thin Diet ought to be appointed, viz. of meer Oatmeal and Barley; and for ordinary drink, a Ptisan or Posset-drink rather than Beer alone:

alone is convenient: although in an outrageous thirst this also is to be allowed of in a moderate quantity. Moreover, for quenching thirst, Juleps, Apozemes, and Emulsions are taken by turns; to all which adde Sal Prunella. Secondly, let only the temperate Cordials be administred which mildly do recreate the animal spirits, and not at all intend the kindling of the blood, burning out of its due proportion. For these intentions, the water of *Carduus Maria*, *Carduus Benedictus*, of Balm, Borage, Cowslips, Black-cherries, are usually given with success: whereto let the powder of Pearls and Coral be added. Thirdly, It behoveth to administer Anodynes, both inwardly, to provoke sleep in case it be very much wanting, and also externally, to alleviate the pain of the side. Of the former kinde the more usual are the distill'd water, syrup and powder of red Poppies, which are esteemed Specificks in a Pleurisie and in a Peripneumonie: Moreover, when the pain is very acute, and watchings instant upon the patient, they may lawfully drink Diacodiates. Against pains, Liniments, Fomentations, Cataplasmes, and sometimes the hot bowels of Animals newly slain are convenient to be applied. These are the principal Intentions of healing which seem requisite to cure an exquisite and simple Pleurisie, before it contracts a Peripneumonie to it self, or passes into it, or into an Empyema. It only remains to adapt to each of these the more select forms of Medicaments.

Cardiacks.

Anodynes.

First therefore in the beginning of the Disease, for taking away the Phlegmon, Juleps, Apozemes, Powders, and gentle loosening Clysters are wont to be prescribed.

Forms of Remedies.

Take water of *Carduus Maria* eight ounces, red Poppies 4. ounces, Syrup of red Poppies one ounce, sal Prunella one drachm, make a Julep, the dose two or three ounces every third hour.

First for the removing the Inflammation.

Juleps, &

Apozemes.

Take of Grass-roots 4. ounces, Barly half an ounce, Apple-parings one handfull, Raisins one ounce, Liquorish two drams, boyl them in three pints of Spring-water to two; clarify the strained liquor, adding Syrup of Violets one ounce and half, Sal Prunella one dram and half, make an Apozeme, the dose 3 or 4. ounces often in a day.

Take of Sal Prunella two drams, flowers of Nitre one dram, powder of red Poppy flowers two scruples, Sugar-candy 4. scruples, make a powder, the dose half a dram three or four times in a day.

Powders.

Take of the Decoction of Mallows, leaves and roots, with Prunes, one pound, syrup of Violets three ounces, Sal Prunella one dram, make a Clyster.

A Purg.

Take Cassia bruised two ounces, Tamarinds one ounce, Damask-Rose leaves one handfull, Coriander-seeds two drams, boyl'd in Spring-water to a pint, strain it, and adde Syrup of Chicory with Rhubarb two drams, clarify it with the White of an Egge, the dose is 5 or 6 ounces in the morning, continued for two or three dayes.

Secondly, The following are of use to dissolve the clamminess or coagulating viscosity of the blood, in form of a Drink, of a Powder, and of Spirit.

Secondly for the taking away the clamminess of the Blood.

Take fresh Horse-dung 4. ounces, Carduus-water one pound and half, infuse it warm for two hours, after filtre it, to which adde syrup of the juice of Dandelyon, or of Chicory, two ounces, Spirit of salt Armoriack one dram, let five or six spoonfuls be given three or four times in a day.

An Infusion of Horse-dung.

To this end Water of Horse-dung wonderfully profits.

Take of Horse-dung 4. pounds, leaves of *Carduus Benedictus*, *Carduus Maria*, Scabious, And distilled Pimpernel, of each three handfulls, upon them cut and mixt together pour six pints of water. new Milk, distill them in common Organs. The Dose is from two Ounces to three, either with it self, or with other distill'd Waters, in form of a Julep.

For the same use, the Tinctures, or the solutions of other Dungs are administred by some Physitians, and highly magnified by them. *Helmont* commends the dung of an Oxe, *Panarolus* commends Pidgeons-dung, others the white dung of a Cock, for the Pleurisie. *Epiphanius Ferdinandus* was wont to give with success the Decoction of Tobacco with new Wine; *Valeriola* by experiment as a familiar remedy made use of the Decoction of the Flowers of red Poppies: The renowned *Sylvius* prescribed the following mixture to be taken by Spoonfuls, within short spaces of time.

Sylvius's Anti-Pleuritick.

Take

Take Parsly and Hyssop water, of each two ounces, Fennel-water one ounce, Treacle-water simple half an ounce, Laudanum Opiate 4 grains, Salt Armoniack half a scruple, Syrup of red Poppies one ounce. Mingle them.

Frederick Deckers adds to this the Powder of Crabs-eyes, and Mineral Bezoar, of each one scruple.

Medicines chiefly efficacious for this use are wont to be administred in the form of a powder: for examples sake,

Powders.

Take Powder of Crabs-eyes two drams, Sal Prunella one dram and half, of the flowers of red Poppies half a dram, mix them and make a Powder, the dose half a dram, three or four times a day, in a convenient Vehicle.

Instead of Crabs-eyes, the powder of the Jaw of a Pike, or the Tusk of a Boar, or the Pizzle of a Stag, or Bull, are used, and if they prove ineffective, try the following.

Take of Antimony Diaphoretick, or the Cerus thereof, or Bezoar Mineral, two drams, the volatile Salt of Harts-horn half a dram, the powder of red Poppies two scruples, make a Powder; The dose from one Scruple to half a dram, three times or oftner in a day.

For the same intention of curing it was, that Riverius gave of the Powder of Soot from half a dram to a dram; others the powder of Pidgeons dung, or of a Cock. And indeed by reason of this analogie, whereby the dungs of Animals stored with volatile Salt, do succour in this disease; it is probable, the dung of a Dog doth no less conduce to cure a Pleurisie than a Squinancy, and so much the rather, because these diseases frequently change their forms among themselves, and one assumes the species of the other: Chymical liquors endued with a volatile Salt do also notably help sometimes in a Pleurisie.

Chymical Liquors.

Take of Spirit of Blood two drams, Water of red Poppies three Ounces, the Syrup of the same one ounce. Let it be given by spoonfuls often.

Take spirit of Sal Armoniack, distill'd with Olibanum, three drams, the dose from 12 drops to 15 or 20, twice or thrice a day, in any convenient liquor. After the same manner the Spirit of Urine, Soot, or Harts-horn may be given.

Take the Spirit of Tartar 3 drams, the dose one scruple in a convenient vehicle.

Take of the simple mixture 3 drams; Dose from one Scruple to half a dram.

What remedies the third intention requires.

As for the third Intention, besides a thin diet, Cardiac remedies and Anodynes are prescribed: Examples of the former kinde for the first Indication may be supplied by Juleps and Apozemes; for the second Indication they may be supplied by Spirits and Powders. Anodynes are prescribed to be exhibited inwardly upon watching, and very intense pain, according to the following method.

Hypnotick Anodynes.

Take of Poppy-water two ounces, the Syrup of the same 6 drams, Spirit of Harts-horn 12 drops, make a draught to be taken at Bed-time.

If we must proceed higher, Take Carduus-water two ounces, Diacodium from three drams to half an ounce or 6 drams, Spirit of Sal Armoniac with Frankincense half a scruple, make a draught: and sometimes although rarely Laudanum is expedient, which timely given, inasmuch as it excites sleep, and moves sweat and Urine, does greatly profit.

Take Cowslip-water two ounces, Tartariz'd Laudanum from 16 drops to 20. the Spirit of Blood half a Scruple, Syrup of Violets two drams, mingle them for a draught.

External Anodynes.

Outward Anodynes in form of a Liniment, Fomentation, and Cataplasim, are usually prescribed.

Take Oyntment of Marshmallows two ounces, Oyl of Almonds one ounce, Dogs-turd two drams, mix them by grinding together.

Take the Plaister of Mucilages two ounces and a half, moistened with Linseed-Oyl, and applied upon Lawn-paper.

Take the tops of both Mallows, the leaves of Mercury and Beetes, of each 4 handfuls, boyl

boyl them in Spring-water, and strain'd, let it be used for Fomentation.

Take the Dregs of the herb: after the liquor expressed, to which adde the bran of Oats 6 ounces, Linseed and Fœnugreek seeds, of each two Ounces, Oynment of Marsh-mallows two ounces, make a Cataplasme.

There is no occasion to go far for Histories and Instances of patients sick of a Pleurisie, for a notable Example of this disease is now under our hands: to wit, A very lovely Maid, frequently and as it were habitually obnoxious to that distemper, is committed to our care. This Virgin being very amiable, of a sanguine complexion, but of a weakly constitution, upon any the smallest occasion, viz. by taking cold, or by errors in any of the six Non-naturals, yea sometimes from the meer alteration of the year, or the air, has for many years been wont to fall into a fever; whereupon immediately pleuritick pains, with a Cough and difficult breathing come upon her, and afterwards for the most part hideous Convulsions; under which passion in time past she did so grievously labour, that frequently every year for or above six months she was constrain'd to keep within her Chamber. But of late, although she is not acquitted from this hurt, yet she is seldomer punish'd with it. The last year all the Summer, and almost the Autumn, she enjoyed her health indifferently; in the beginning of Winter she took her bed with this sickness, and now about the end is again sick. A pain from the Pleurisie constantly afflicts her right side, where the blood sticking in its passage, and being extravasated about the intercostal muscles, the Fibres being provoked, fall into a most troublesome condition, together with a convulsive motion of Coughing, and almost perpetually repeat it: In the mean while her Lungs being sound enough, and open as to the passages, do readily convey the blood without any stop by its clamminess, (which frequently is the author of a Peripneumonie.) No remedies that are used will do her good without phlebotomie, which continually is so very necessary, that upon every return of the sickness, in spite of all things, we are compelled three or four times to repeat it, and sometimes oftener: the blood let out in the Superficies hath constantly a viscous and whitish filme. This disease was ever a simple Pleurisie void of a Peripneumonie, and for cure she with constant success used the following method.

Take Spirit of Sal Armoniack distilled with Gum Ammoniacum three drams; take from 15 drops to 20, three times a day, with the following Julep.

Take Carduus and Black Cherry water, of each six ounces, Hysterical Water one dram Sugar 6 drams. Between whiles she took a dose of this Powder with three ounces of Apozeme.

Take Powder of Crabs eyes, of a Boars tooth, Sal Prunella of each one dram, make a powder for 6 doses.

Take Grass-roots 3 ounces, candied Eringo one ounce, Shavings of Ivory and Hartshorn of each two drams, the Parings of Apples one handful, Raisins one ounce, boyl them in three pound of Spring-water to two pound, to it strain'd, adde Syrup of Violets one ounce, sal Prunella one dram, mix them, and make an Apozeme.

Cysters of Milk with Syrup of Violets were injected, sometimes every, sometimes every other day. If Opiates, however mild, were given to allay pain, upon it a pain and drowsiness of the head, and Convulsions did infect her most grievously.

SECT. I. CHAP. X.

Of an Empyema.

An Empyema is the product of other diseases of the breast.

IT is clearly manifest from what hath been said before, that a Pleurisie, and Peripneumonie, are diseases not only akin but commutable among themselves, and successive to one another; Moreover, as well this as that, and frequently both together, not being well cured, doe pass into an Empyema. For when a Phlegmon rais'd about the Pleura is brought to suppuration, at length the Imposthume being broke, the matter falling into the cavity of the Thorax, produces this disease. In like manner sometimes it follows from the Lungs being inflamed: inasmuch as the ichor accumulated about the place affected, turns into a thick and yellow humour by a long digestion, which unless it be ejected by a Cough, either sensibly corrupting the inner substance of the Lungs, it causeth a consumptive disposition, or dissolving the unity of the intire Lungs, and at length corroding the outmost membrane, it slides down into the breast, and so engenders an Empyema. Any one labouring with an Imposthume or ulcer of the Lungs, although he do spit out abundant and foetid matter (as it frequently happens in an Imposthume of the Lungs,) is not therefore accounted obnoxious to an Empyema. For in truth, by the common acceptation of this Term is signified a Collection of rotten matter within the cavity of the Thorax, by which the Organs of breathing are oppressed: but that rotten matter is wont to have a conflux thither either by a Pleurisie or Peripneumonie, (and sometimes perhaps from a Squinancy) brought first to suppuration and afterwards broke.

It rarely or never begins of itself.

Forasmuch as an Empyema never begins primarily and of it self, but for the most part is the effect or product of other diseases, not duly cured, it will not be requisite to make much inquisition about the causes thereof. The formal reason or conjunct cause thereof is known well enough, (to wit) it is a purulent matter, poured out from the Pleura, or the Lungs, or the Larinx, into the cavity of the Thorax. But the other proper causes of the previous effects, appertain to the Etiologies of every of them.

What the morbid matter is.

There is a certain dispute about the morbid matter; for some contend that it is meer corruption, others not that, but that it is a purulent matter, of which opinion is *Johannes Heurnius*, who averring a purulent matter for the conjunct cause of an Empyema, distinguishes between this and mere and pure Pus, affirming this to come to pass from a bloody nutritious humour, i. e. from the blood it self somewhat corrupted, but capable of digestion, but that a purulent matter is an excrementitious humour, viz. a Serum or Ichor, which proceeds from the blood obstructed and hindered somewhere in its Circulation. From hence we may observe concerning an Imposthume which affords true and laudable Pus or matter, that it is for the most part compact, every way shut up and wrapt up together either in a bladder, or (as it were) within private Apartments, and then after it is maturated and broken, pours out the contained humour, and is soon and easily healed. But an Imposthume affording a purulent matter forms its nest not so bound up and encompass'd with walls, but for the most part unequal and crooked, and being broken rather pours out filthy blood or gore than matter or Pus, and then by reason of the successive source of excrementitious humour, it is very difficultly healed.

The difference of Pus and a purulent matter.

Moreover, we are to consider, that each humour as well Pus as purulent matter doth sometimes stink notably, and is also sometimes very free from any bad flavour. Some maturated and broken Imposthumes pour out fetid matter, others matter without any smell. I have often observ'd Imposthumes of the Lungs, as well as Phlegmons of other parts to have this several distinction. Purulent matter from many Ulcers stinks ill; the Spittle of consumptive persons which is esteemed to be very dangerous, for the most part is without any scent. It is usual where the side is opened by reason of an Empyema, that at first the matter flows out not unsweet, but after two or three days the air having more frequently enter'd into the orifice, it stinks most horribly: which stench notwithstanding after an injection of some aromatical or vinous Spirit vanishes again in a short space. But it would be a thing of much tediousness

Why both sometimes with, and sometimes without stench.

dioufness to denote the particular reasons of each of these accidents and alterations, for that never so little alteration of the Pus or purulent matter, both causes and removes the stench from them. When the sulphureous particles are equally digested, and being subjugated to the salts are contained in a mixture, there is no stench; but as soon as they being loosed begin to fly away, and carry the salt particles with them (whereby they are sharpened) they disperse a very bad stench round about. But whereas an Injection or Lotion with vinous and aromatical liquors, being sometimes administered to a putrid Ulcer or nest of an Empyema, frequently removes all stench; the reason is, because the sides of an Ulcer, no otherwise than as a stinking pot, infect the contained liquor as with a certain ferment, and so impress a stink: but when that ferment of the vessel or bowel is washed or overcome by a well-tempered and strong liquor, then that propagation of a stench ceaseth. From hence follows not always an ill sign, nor is it so very good, if the Spittle of consumptive persons, and the Imposthumes of such as are Empyematical are excerned either with, or without stench; for that I have known it to have been to some healthful, and to others deadly in either case. Moreover a more certain Judgment is not to be taken from thence, that the spittle of some consumptive persons floats upon the water, and that of others sinks.

But although we do not much disapprove of that distinction of Pus and purulent matter, notwithstanding we adjudge neither only this, nor always that, to be a conjunct cause of an Empyema. Whenas this disease succeeding a simple Pleurisie, arises from an Imposthume being suppurated and broken in the side, it is most commonly pure and meer Pus, which falling into the cavity of the breast, engenders that disease. But if an Empyema be an Offspring of a Peripneumonie (unless an Imposthume of the Lungs intervene) the ichorous matter being accumulated about the place of the phlegmon, and after thickening by meer concoction, it wounds the Lungs, and at length making a hole through the membrane encompassing it, and flowing out into the Thorax, produces an Empyema. That matter is rather to be accounted purulent than meer Pus.

*Neither the
cause of an
Empyema.*

The signs of an Empyema either prognosticate it while it is in fieri, or indicate it plainly done. Some foregoing diseases are esteemed of the former sort, whose issue this uses to be, of which sort are the Pleurisie, Peripneumonie, and Squinancy, also sometimes a stroke or wound of the breast, and sometimes other distempers thereof, not well cured, nor discharged; out of which the suspicion will be greater of an Empyema to ensue, if after one or two weeks without abundant Spittle, the shivering of an Ague and fainting of the Spirits overtakes one. Then after fourteen or twenty days, there will be signs of an Empyema fully made, as difficult breathing, a heaviness of the breast, a swimming to and fro of the matter, and a sense of pain from the position of the body chang'd, thirst and a small fever almost continual, redness of the cheeks, disquietness of the whole body, and watching.

*The Signs of
an Empyema
whilst begin-
ning.*

An Empyema is distinguished many ways, viz. First according to the distemper going before, whose Offspring it is; also according to its seat, one while in the right side of the breast, another while in the left, and another while in the whole capacity thereof; and lastly, as to the morbid matter, which is either meer and laudable pus, or purulent matter, and this one while gentle, and benigne, and another while sharp and stinking.

When perfect.

Prognosticks of this disease begin as well before as after incision; the former determines whether the side ought to be opened or not, also it prefages of what sort the event will be, either with or without opening. If an Empyema succeeds more slow, after the first distemper, to wit not before the thirtieth or fortieth day, whenas the strength is very much worn, and the Lungs are vitiated, and their structure hurt; and also if a fever remain as it were hectic, the breathing short and painful, the Pulse weak and quick, with cold sweat, and with a Diarrhea or wasting looseness, and frequent faintings of the Spirits, then the state of such a person being evidently desperate, doth not admit of any opening; let a Physician suffer him to dye without bleeding, lest he seem to murder him. But if on the contrary, after manifest signs of an Empyema more maturely perfected, the painfulness of the Lungs or side, as also the fever and other symptoms abate, and the Pulse, and strength of the Spirits are in vigour, it will be lawfull safely to advance to cutting, and thereby to hope a happy success. Incision being made, if white Pus duly concocted or otherwise laudable skip out with ease, and thence the heaviness of the breast and difficult breathing

*Prognosticks of
this disease.*

abate, and the patient is better as to the other passions, there will not the least doubt remain of his cure: but if no Pus, or that which is bad, if thin, something bloody, or stinking, flow from the side being opened, we can conceive thereby but small hope of recovery.

What it signifies when the Probe is gilded by the Empyematal matter.

Hippocrates among the presaging signs of a mortal Empyema, recounts that of the Probes being coloured by the Pus, as by fire; or what we often observe, and sometimes without any evil event, if the silver Probe being put into the orifice of the open'd side, be presently ting'd with a colour as it were of Gold or Copper; which surely signifies no other thing but that the sulphureous particles of the pus, or purulent matter are so exalted, and loosen'd from the bond of mixture, that easily departing they may be affix'd to any other body, and especially silver, whereunto they are akin. Sometimes I have seen Venison kill'd by long and wearisome hunting, presently bak'd in an Oven for Entertainment, become not only most tender, inasmuch that it might be taken out with Spoons, but even to have gilded a bright silver Spoon at the first touch. The reason whereof is the same with the former; viz. that the flesh was so disposed to putrefaction by too much exercise while the animal lived, that the particles of the Sulphur being exempt from Concretion, and apt to fly away, presently adhere to any other fit subject: But this by the by.

The cure of the distaste.

As to what belongs to the curatory part of an Empyema, we ought chiefly to consider whether the signs of this disease, as being now perfected, be certain, or doubtful. In the former case there will not be much need of Medicine, but the body only being prepar'd before-hand, we may immediately proceed to the opening of the side. Wherefore, if from a Pleurisie or Peripneumonie not rightly cur'd, or from blood poured out after a stroke, fall, or inward wound, a fluctuation of Pus or purulent matter, or bloody within the cavity of the Thorax, be perceived, with no Spit- tle, or with little, there will not be need that we dwell longer on maturing or expecto- rating Medicines, but the belly being loosened, and the blood and humours rightly tempered by Juleps, Apozemes and Anodynes, either that a bare Section be or- dained; or that in tender and fearful persons a Caustery be applyed between the 6th and 7th Vertebra, and after the Eschar is rais'd, the Incision-knife be obliquely forc'd by little and little, towards the hinder and upper part, untill it penetrate into the very Cavity of the Thorax; afterwards, a little silver Pipe being put in, let the contained matter be sent out by degrees; notwithstanding in such manner that, if his strength will bear, an evacuation of the whole humour be accelerated; for a portion thereof being left within, often contracts a hideous stench, within a few days (by reason of the Air, as is abovesaid, being admitted) which evil, that it may be provided against, or soon removed, a vulnerary and absterfivive liquor is to be cast in twice or thrice a day by a Syphon or Syringe. It will not be requisite to prescribe particularly the other things belonging to this operation, and the process thereof; for that each of these things are evidently known to any of the more expert Chi- rurgeons, and are used in familiar practice. After incision and the appertaining admi- nistrations rightly performed, there will not be much besides left for a Physician to doe. It is convenient there be a right course of Diet, a frequent loosening the belly (as often as need shall be) by Clysters; and moreover it behoveth us to prescribe remedies vul- garly called Vulnerary, which hinder the dissolution of blood, and the profusion there- of into serosities injurious to the breast.

The cutting or opening the side.

The Empyemati- cal matter is wont to stink by the often ad- mission of the Aire.

Those things which persuade or forbid a Pa- racentesis.

But if the Signs of this Disease be less certain, and (as for the most part it is wont to be, from a Peripneumonie and Imposthume of the Lungs going before) altogether doubtful, Incision must not too soon or rashly be made. For I have known some spit- ting forth a purulent matter, yea a fetid Pus, with painfull breathing, and heaviness of the breast, to have undergone a Paracentesis in vain, and not altogether exempt from hurt. Wherefore, until it is apparent by pathognomic signs that it is an Em- pyema confirm'd, expectorating medicines (as are before prescribed for the cure of a Peripneumonie) as also things gently moving evacuation by Urine and Sweat, may be used for some time: But these availing nothing, and the Empyema still remaining or increasing, (because whilst there is strength it is better to try doubtful Medicines than none) proceed to a Paracentesis.

Forms of Re- medies.

As to the Forms of Medicines requisite to the curing an Empyema, before Incision, the same remedies that are prescribed in a Peripneumonie are convenient; but the Pa- racentesis being made, these following will be chiefly in use.

Against fainting of the Spirits, and swoonings which happen in that operation, or afterwards,

afterwards, let the following Julep be at hand to be taken now and then about four or five spoonfuls.

Take Balm and Black-cherry water, of each six ounces, Aq. Mirabilis one ounce, powder Cardiacs. of Pearle one dram, Syrup of Gilliflowers one ounce. Mingle for a Julep.

The following Decoction to be drunk three or four times a day.

Take of Harts-tongue, Speed-well, Agrimony, Colts-foot, Mouse-ear, Sanicle, of each one handful, Madder and Chervil-roots of each one ounce, Barly half an ounce, red Cicers half an ounce, Raisins an ounce and half, boyl them in four pound of Spring-water to half, sweeten it with clarified Honey, or with Syrup of Mouse-ear as you take it, to your pleasure. If a Feaver be wanting, the following Pills may be taken from one scruple to half a dram, Evening and Morning.

Take powder of Crabs-eyes two drams, Flower of Sulphur one dram, Sal Prunella half a dram, Spec. Diarrhodon Abbatis one scruple, Venice-Turpentine washed, make a mass formed into small Pills, or omitting the Turpentine take the powder from half an ounce to two scruples, twice in a day.

Examples of persons sick of an Empyema are not so frequent, and those cured of that Distemper more seldom. I have known two, unwilling to admit of an Incision prescribed by all means by the Physicians, to have fatally expired, and their dead bodies I have dissected. Also I saw that operation administered to two others, whereof one recovered health, the other dyed consumptive; but the reason thereof was, his Lungs being notably corrupted, and his strength utterly lost, the too late opening his side conferr'd no help to him; but did much depress his spirits, weak enough before, and wasted his strength. He whose side was opened, had Lungs sound enough; but from the Imposthume of the side being broke inwardly, the matter falling into the cavity of the Thorax did so compress the Diaphragma that he could scarcely breathe. The Chirurgion without a Caustick thrust in his Incision-knife between the 6th and 7th Vertebra, and having made a hole quite through his flesh, he put in his Pipe. A bloody ichor first flowed out, afterwards being drawn away by a moderate quantity at times for three dayes, it flowed out without any stench; but afterwards as often as the Orifice was opened, a most horrid smell came forth, exceeding the stench of any Jakes, though ne're so stinking, and infected the whole Chamber with the ill scent: Moreover it remain'd so for many days, untill by injections made of Myrrh and bitter herbs, boyl'd in Water and Wine, and very often administered every day, at length it was extinguished; by the daily use of which, the morbid matter and at length all the fordidness being washed away, all flowing out ceased; and last of all the Orifice being closed, the patient recovered his entire health. I dissected the dead bodies of those who dyed, when by no perswasion of Physician or Friends they would admit of the opening of their side. One I have spoke of elsewhere, the result whereof was, the Pus streaming from the Imposthume raised in the Pleura, and in the intercostal Muscles, and broken internally, had wasted part of the affected place, and of the contiguous Lung, with a Sphacelus or Gangrene, and so corroding the Diaphragma, and a hole being made on the right side thereof, it had descended into the Viscera or bowels of the lower belly: and there in the whole passage of the Ventricle and Intestines, the outer Coats on which the purulent matter had fallen, appeared eaten and discoloured; and at length the purulent matter corroding and boring through the *intestinum rectum*, it came forth through the fundament together with his excrement. The sick man being strong and impatient of any medicine, endured the tyranny hereof for about two months, but in the mean while he lived miserably, afflicted with a light Feaver, thirst, inquietude, pain of the stomach, and frequent tumbling up and down, and almost with continual watchings. His body being opened after his decease, a most horrid stench, exceeding any Jakes, diffused it self throughout the whole Chamber. The Anatomy of another who dyed by an Empyema, afforded not so vast an effusion of purulent matter. This indeed had its nest in his side, from whence falling into the cavity of the Thorax, and there accumulated in a vast heap, and continually defiling his Lungs drenched therein, it caused a flow and as it were a hestick Feaver, whereby the patient, being very old, dyed.

An History of one troubled with an Empyema, the cutting of whom was mortal.

Of another who recovered by that remedy.

The History of one who dyed because he was not cut.

A fourth History like the former.

SECT. I. CHAP. XI.

Of an Imposthume of the Lungs.

Monica Pulmonis a disease seldom observ'd.

A *Monica* of the Lungs is something a-kin to an Empyema or Peripneumonie, considering that the morbid matter is always meer Pus, which notwithstanding is generated in the Lungs without a Fever and Phlegmon, yea without any great Cough or Spittle, as it were silently, and without noise; and frequently this evil doth not discover it self before it kills the patient. *Galen* makes mention of this in lib. 1. de locis affectis; but among Authors who have written Systemes and the practical parts of Physick, mention thereof is seldom or scarce to be met with. *Tulpius* in lib. 2. chap. 10. describes this distemper after this sort. *This evil (meaning an Imposthume of the Lungs) lurks in the beginning so secretly that it scarce discovers any signs of it self, besides, in the first place, a little dry Cough, and presently moist; which continuing for some time, the breath is drawn with difficulty, the spirit fails, and the body withers by degrees, although in the mean time the Spittle makes no shew either of pus or blood; and if the Imposthume break by way of surprisal, the man is kill'd immediately.* It is wont sometimes so to happen, but I have known many who in an Imposthume rising insensibly, being maturated, and at length breaking, have spit up great plenty of fetid corruption; and though with voiding daily such a Spittle, for many weeks, nay months, they became very weak, and as it were consumptive, yet at length by the help of Medicines, after the Ulcer hath been mundified, and dried, they have recovered their health entirely.

The formal reason and conjunct cause thereof.

This disease, if we search into the formal reason and conjunct cause thereof, is in truth a concurrence of ill humours gathered in some part of the Lungs; whose matter although it be heterogene and an enemy to nature, notwithstanding from the beginning appears not sharp, or irritative. For when at first being separated from the blood, it is deposited in some hollow place of the Lungs, perhaps in some bladdery cell, it doth neither raise a Cough nor produce a Fever; but afterwards when sensibly encreased it compresses the neighbouring Vessels bringing blood, and moreover insinuates into the very blood passing by, incongruous Effluvia; from thence a small Fever succeeds, with a certain disquietude, and febleness; and at length being accumulated to its fulness, and maturated by a long digestion into mere pus; breaking its nest very much distended before, it flows out every where all about. But if the ways are not open for the issuing of the pus, it incontinently mingles it self with the blood, and either empoysons it, or impedes it from Circulation; or rushing by heaps into the Tracheal passages, it doth fill most of them at once, and so stuffs them, that a sufficient entrance is denied to air to kindle the blood, and presently the vital flame expires: but if this matter find passage, and flow by degrees into the Trachea, from whence again it may be presently carryed away, and spit out, there will be then some truce of life, with hope and opportunity of cure. And indeed I have known many cur'd of this disease.

The morbid matter.

The usual matter of an Imposthume of the Lungs is meer Pus, which often stinks notably, and by that differs from the Spittle which is ejected in a Peripneumonie or a Consumption of the Lungs. But whence that matter proceeds in the beginning thereof, and of what disposition it was before it was ripened into pus, I cannot so easily determine: because the seeds of this disease being privily sow'd, and growing up secretly, spring wholly from an occult original; wherefore its procatactick or more remote causes lye conceal'd, yea while it begins and increaseth, can neither be discovered by any pathognomical Signs, nor can any prognostick be devised, before it discovers it self with a mortal stroak, but the whole procedure thereof is treacherous.

Now if after the Imposthume is broke, and the spitting up of pus with an easie discharge being begun, with a constancy of strength, there be means offer'd for some method of cure, the chief Indications according to the common custom in most diseases will be these, viz. Curatory, preservatory, and vital. The first commands the matter of the Imposthume speedily to be discharg'd by Spittle, and that the sides thereof should be cleansed and healed as much as is possible. The second Indication

dication provides against the conflux of new matter to that nest, or other adjoining places of the Lungs (whence a Consumption may be engendred). The third restores the languishing of the Spirits, the lost strength, and the frustrated Nourishment.

1. As to the first Indication, remedies commonly called expectorating, and of them those that are more hot and sharp, and do very much cleanse and drye, but especially (for that for the most part here a Fever is wanting) sulphureous remedies are expedient; which also may be prescribed according to the following forms.

Take of Tincture of Sulphur three drams, take from seven drops to twenty, at bed time, and early in the morning in a spoonfull of Syrup of the Juice of Ground-Ivy. Or, First Indication.

Take our syrup of Sulphur, as before set down, 6 ounces, let a spoonfull be taken at the same hours. Forms of Remedies.

Take the dried leaves of Ground-Ivy, Germander, white Maiden-hair, Coltsfoot, Hyssop, white Horehound, Savory, of each one handful, Enula-campane, Orris, and Chervil-roots, of each one ounce, Anniseeds half an ounce, boyl them in 6 pound of Spring-water to three pound and a half, adding towards the end White-wine 6 ounces, clarified Honey three ounces. Let the strained Liquor be clarified, and kept for use: the dose 6 ounces warm, three times a day. Or,

Take of Lime-water 6 pound, put it in a Glass with a large mouth, hanging in it the following bag:

Take the dried leaves of Germander, Ground-Ivy, white Horehound, of each one handful, Orris and Enula-campane sliced one ounce and a half, Anniseeds bruised two ounces, Liquorish an ounce and half, Raisins stoned three ounces, let them be stopt and stand cold. Pour out for use, the bag remaining.

Take Lohoch Sanum three ounces, Species Diatreos two drams and a half, flower of Sulphur one dram and a half, of simple Oxymel two ounces, make a Linctus to be licked with a Liquorish stick.

Take the powder of Hedge-mustard, Ground-Ivy, of each half an ounce, flower of Sulphur a dram and a half, syrup of Sulphur (or of the juice of Ground-Ivy) what will suffice to make a Lohoch.

Take of fine Mirrh, of white Amber, of each half an ounce, Sulphur Vivum, Auripigment, of each two drams, the rinds of Pistaches one dram and a half, make a powder for Fumigation, to be used in a Paper-funnel, morning and evening.

2. The preservatory Indication, abolishing the morbid matter, and so providing against a Phthisis prone to succeed; endeavors the purifying of the blood, and strengthening the Lungs, to which ends, Purgers, Vulnerarie Decoctions, distill'd waters and physical Drinks, are convenient. Second Indication.

Take of the Decoction of Senna of Gereon (with one dram and half of Agarick) three ounces and a half, purging Syrup of Apples one ounce, Aq. Mirabilis two drams, make a potion to be taken with government once in a week.

The form of the Wound-drink let be the same as was prescribed for an Empyema after opening, or 4 or 6 ounces of the Decoction common in Shops, three times a day, (because here is no fever.)

Take of Firre-tops 6 M. fresh Ground-Ivy, Hyssop, Sage, Rockets, Hedge Mustard, St. Barbaries herb or Winter-creffes, of each four handfuls, the seeds of the Sun-flower 6 ounces, sweet Fennel-seeds two ounces, Enula-campane, Orris-roots, of each 3 ounces, being cut and bruised, pour upon them 8 pound of Brunswick Mum or Spruce-Beer, distill it in a cold Still, let the liquor be all mixt, and when used, sweetned at pleasure with syrup of the juice of Ground-Ivy; the dose three or four ounces, three times a day.

Take of the roots of Sarsaparilla six ounces, China two ounces, of each of the Sanders six drams, Shavings of Ivory and Hartshorn, of each half an ounce, Mastick-wood one ounce, being cut and bruised infuse them in 12 pound of Spring-water, boyl them to half, adding one ounce of Liquorish, Raisins 4 ounces, let the strained liquor be kept for ordinary drink.

3. The vital Indication prescribes Cordials, Anodynes, and a convenient course of diet. The same forms of Medicines for the most part are expedient here, which were pre- Third Indication.

Fontinels in the
side very often
greatly help in
this disease.

prescrib'd for an Empyema after incision, and also the same diet as was ordain'd in a beginning consumption; besides, in this case Asses-milk often-times doth much good. As to the curing this disease, I have observed, that an Issue made in the side, for the most part doth signally profit. I remember two suffering under this distemper, by coughing up plentifully mere stinking Pus or Corruption after the Imposthume broke, to have been heal'd by this Remedy in a short space of time. The Histories of the Cures shall be afterwards annexed. In both these by a shallow orifice made in the side by incision, meer Pus began within three or four days to flow out, and then the Spittle began to be abated; and after that flowing, encreased from day to day, for some time continued, the Spittle altogether ceased, and the Patient recovered his entire health.

The reason of this admirable Effect seems to be, that the part affected of the Lungs, or that which is bordering upon it, while the disease was arising, or before, grew to the very side, and therefore Nature had endeavour'd by this way the thrusting forth of the Pus or matter contained in the Imposthume; and for that cause perhaps had made secret passages even to the superficies of the side; wherefore, afterwards an issue being laid open by a knife, the excretion of the morbid matter was conducted thither. It is also probable, that a certain part of the Lobe of the Lungs at first grew to the side in the diseased, and by reason of the cleaving thereto, afterwards the Imposthume had its rise; for whereas that part being almost immoveable, could not be stirred like to the other parts of the Lungs, the morbid matter was deposited there, and was the better able to reside or form its nest there.

Although the Imposthume of the Lungs be thought a very rare distemper with some Physicians, and by *Tulpius* judg'd so mortal, that when it breaks it kills out-right; yet I have known many to have labour'd under this disease, and by the help of Medicines to have recovered their pristine health. We may here describe two or three of the more remarkable Histories of them.

A Gentleman of a middle age, and before strong and continually healthful, finding himself not well, without any apparent cause, contracted as it were a crazie disposition; for being without pain, without Vomit, Cough or notable Fever, in a short time grown weak, he became without any appetite, unapt to sleep, full of thirst and hot about the precordia; this person was handled a long while by some Physicians as Scorbucal, and by others as hectical; and after various methods of healing were assay'd in vain, at length the disease sallying out as from an ambush, appeared manifestly. For whilst on a certain night being more unquiet than usual, he tossed himself very much in his bed, all on a sudden the Imposthume breaking in his Lungs, a large quantity of stinking pus was thrown out by Cough, so that in four or five hours he threw off about two pints. Moreover, after his Cough continuing about two months, he daily spit out purulent matter, thick and very stinking, untill his flesh being consumed, and he wholly spent, was reduced to languishing, and a notable Consumption. From the stench of his Spittle and breath the whole Chamber was so filled, that his Servants or those attending him, could not endure the ill scent thereof.

After the Imposthume was thus broken, I and two other well-known Physicians being advised with, with all circumspection we prescribed Medicines to absterge and heal the Imposthume, and to cleanse the Blood and Lungs, and to redeem him from an imminent Consumption. A Tincture, and Syrup of Sulphur, together with Pectoral and Vulnerary Decoctions and Distillations were taken; also Lohochs and balsamick Pills, day after day in a constant course, with Clysters, gentle Purgatives and Diureticks, were taken between whiles: then these, Vaporations and Fumigations, as well sulphureous as arsenical, were used morning and evening. After these things being long and carefully used did help nothing, I often propounded the opening of the Thorax; but the sick man obstinately rejecting this operation, said he would rather dye than be murdered; yet at length, when I assured him that this remedy, or none, was further to be attempted, he began to deliberate with himself, and immediately baring his breast, he suffered me to search a place where I might apply a Caustic; the business was presently put out of doubt, for a Tumour appeared on the left side of the Sternum, between the 5th and 6th Vertebra. Instead of a Caustic, I applyed thereto a suppurating Plaister, and within three dayes the top of that swelling became red and soft: out of which, being the next day opened, first a thin ichor, and a little after a yellow and concocted pus flowed out, and afterwards it continued daily to stream out more plentifully: from that

that time his stinking Spittle began to abate, and within fourteen days it ceased quite; the morbid matter obtaining through that orifice both an easie and more convenient issue. Although by the effect it was manifest, that the passage of that orifice lay open into the breast, and perhaps into the middle of the Lungs, yet no liquor cast in by a Syringe, could either penetrate or be forced in thither: so secret and intricate are the conveyances which Nature forms for her last aids; that by the same passage by which the morbid matter is exterminated, nothing more hurtful can enter. This opening of the side was at length chang'd into an Issue, and a Pease or a wooden pill being put in, there came forth daily for half a year together plentiful ichor; and in the meantime this well-known person, all corruption of the breast being shook off, and the fleshy habit of his body being recovered, became healthful in all respects, and lastly, that issue being removed to his arm, he bears no sign of that nor any other disease in his breast.

After this Cure so by chance accomplished, it hapned I performed another like it, on purpose, not less successfully; for shortly I was sent for to a noble Lady which had been for many years obnoxious to the heat of the precordia with a Cough. One day, when she coughed she was throughly sensible of something broke in her Lungs, and presently she voided abundance of meer pus, and that stinking; after that, this kind of Spittle continuing with a Cough, for a week, notwithstanding the use of remedies, seemed rather augmented than diminished, I advised to have an Issue cut in her side, near the very place whence she perceived the pus to ascend, which she readily granted: Within three days, from the orifice being opened meer pus began to flow out, like that she discharged by Cough. Then after the morbid matter had issued out by that Fontinel, both the Cough and the spitting of pus wholly ceased, and within a Fortnight the patient recovered her firm health.

After this I was sent for to another, viz. a strong man, and as strong a drinker; who being affected with an Imposthume of the Lungs, also spit up an abundance of pus and very stinking matter. This Patient by a certain rude contumacy abhor'd any issue, wherefore he would not suffer any to be made in his side; notwithstanding he took any Medicines offered to him, by a long use of which Remedies he escaped free from that disease: the Medicines whereby he chiefly received help were prepared of Sulphur, as our Syrup and Tincture, taken daily and very frequently. To these for Vehicles were added one while a Decoction, another while a pectoral Hydromel, another while Lime-water, with an infusion of pectoral, as well as vulnerary Ingredients. Moreover Fumigations and Smokes, especially of sulphureous and arsenical Ingredients, did contribute very notable help.

SECT. I. CHAP. XII.

Of an Asthma.

An Asthma a
most terrible
disease.

AMong the Diseases whereby the Region of the breast is wont to be infested, if you regard their tyranny and cruelty, an Asthma (which sometimes by reason of a peculiar symptôme is denominated likewise an Orthopnea) doth not deserve the last place; for there is scarce any thing more sharp and terrible than the fits hereof; the organs of breathing, and the precordia themselves, which are the foundations and Pillars of Life, are shaken by this disease, as by an Earthquake, and so totter, that nothing less than the ruine of the whole animal Fabrick seems to be threatned; for breathing, whereby we chiefly live, is very much hindred by the assault of this disease, and is in danger, or runs the risque of being quite taken away.

An Asthma is denominated from *ασπνισμ*, (which is to breath purfie, or difficultly) and may have this description, that it is a difficult, frequent, and purfie breathing, with a great shaking of the breast, and for the most part without any Fever.

The causes of re-
spiration hurt.

The act of breathing depends as well on moving the Lungs, the Structure whereof ought to be of that sort that its passages, and all the pores may perpetually be open, for the free sucking in and letting out air; as from the parts or organs moving them, which by alternate turns of Systole and Diastole, do cause the hollownes of the breast, and consequently the Lungs themselves to be dilated, and contracted: whereas therefore there are many and divers reasons of disturbance, whereby respiration is prejudiced, for the most part they may all be reduced to these two heads; viz. that there is a fault either in moving the Lungs, or in the parts or instruments that ought to move them, and from hence the differences and kinds of this disease are best of all design'd; for according to the various nature and position of the morbid cause, it is called an Asthma, either meerly pneumonick, proceeding altogether from the passages bringing in aire being obstructed, or not enough open; or it is meerly convulsive, which only arises by reason of a defect or fault in the motive organs; or mixt, when either parts conspire in the fault, which origine every great and inveterate Asthma is wont to have; of each of these we will treat in order.

The Ancients
allowed the
cause of it only
from the Bron-
chia obstructed:

Or vapours from
the Spleen or
Womb, but er-
roneously.

After what
manner the
straitness of the
Bronchia arises.

1. The ancient Physicians, and for the most part hitherto the Moderns have only acknowledged the first kind of Asthma, judging the next cause, and almost the only cause of this Disease, to be the straitness of the Bronchia, viz. inasmuch as the spaces of those passages, being either straitned together by obstruction, or compression, as often as the use of breathing is required, do not admit of plenty enough of Aire, wherefore, for the more free inspiration of aire, as shall be needfull, the organs of breathing do most difficultly labour, with throes most frequently repeated. But that some are found obnoxious to fits of an Asthma, without manifest taint of the Lungs, it was wont to be ascribed to vapours from the Spleen, Womb, Mesentery, or some other bowel, undeservedly enough; but surely that passion, without the straitness of the Bronchia, or fault of those bowels we have in another place sufficiently evidenced to arise from Cramps of the moving parts, and shall be presently clearly made out. But in the mean time by what means it may arise also from the passages of the Trachea obstructed, or compressed, it lyes upon me to declare.

The straitness of the Bronchia, inducing the first kind of an Asthma, is supposed to come to pass by an obstruction, as often as either thick humours and viscous, or purulent matter or blood extravasated, are forced in upon them; or that little swellings, or Schirrus's, or little Stones, stop up their passages; or finally that a Catarrh of a ferous humour suddenly distills upon them. Moreover the same distemper is thought to be raised by compression, as often as matter of that kind (and of every kind of them) shall cleave to the passages of the pneumonic Arterie or vein. Surely, an asthmatical disposition depends upon these various causes and manners of disturbance: but all invasions of the disease, or at least the greater fits are usually provoked by reason of some accidents or occasions. For while the stream of blood sliding and running down gently can be content with a small breathing, it passes through the precordia without great labour either of Lungs or Breast. But being boyling and
passing

passing through the Lungs more impetuously, it requires a more full inspiration of aire; for the freer admittance of this through strait passages presently all the breathing organs are alarmed into most frequent throes. Whatsoever therefore makes the blood to boyl, or raises it into an effervescence, as violent motion of the body or minde, excess of extern cold or heat, the drinking of Wine, Venery, yea sometimes mere heat of the Bed doth cause asthmatical assaults to such as are predisposed. It is usual that those who are obnoxious to this disease oftentimes dare not enter into a Bed; only sleep in a Chair, or on a bed, being covered with garments. The reason whereof is, that the body covered and heated with bed-cloaths, the blood being a little raised into a more quick motion, and grown hot, requires a more plentiful sucking in of air than may be supplied from the passages of the Trachea being straitned: for the more blood passes the Lungs each Systole and Diastole, by so much, for the enkindling and eventilation thereof, the air ought to be more plentifully and quickly brought in, and sent forth: to which task (when by reason of impediments it is not easily dispatched) yet in some manner to be performed, the ultimate endeavors of all the parts appointed for breathing are made use of with a great contention of the whole breast. Moreover the blood being stir'd, is not only an occasion, but also in some part a cause in those that are asthmatically predisposed; for the vessels bringing blood being thereby more fill'd and distended within the lungs, compress the Tracheal passages being already very strait, and render them much more close.

Whatever causes an effervescence of the blood is the evident cause of an Asthma.

Why Asthmatical Persons are worse in bed.

II. A convulsive Asthma (which we judged to be the second kind of this disease, and to be raised without any great obstruction or compression of the Bronchia, from the mere Cramps of the moving fibres) is not limited to one place, or to any peculiar organ, but being of a diffused energy, it is extended to almost all the parts employed in breathing (whereof one while this, another while that, or some other is in fault.) For a convulsive affection inciting an Asthmatical invasion, hath regard to the moving fibres of the vessels of the Lungs, to the Diaphragma, to the muscles of the breast, to the Nerves, which belong unto the Breast, or Lungs, nay to the origine of those Nerves planted within the Brain; and whilst the morbid matter dwells in every of these places, hindering or perverting the work of breathing, it brings on the fits of this Disease, as in another Tract we have somewhat since plainly demonstrated. For the animal Spirits destin'd to the function of breathing, if at any time they are very much molested and constrained into irregular motions, enter inordinately into the Fibres as well nervous as moving of the organs of breathing, and make them for that cause one while to be contracted, another while to be distended irregularly, as also their solemn and equal turns of Systole and Diastole to be variously disturbed or hindered.

A convulsive Asthma.

Its Seat manifold and diffused.

The morbid cause or matter provoking the Spirits prepared for the pneumonic work, as in divers places, so chiefly in these three, is wont to advance its force or power, viz. 1. Either in the muscular fibres themselves, or 2. In the branches or nervous slips, or lastly within the Brain by the origine of the Nerves.

The morbid matter consists in several places.

1. As to the former, the heterogeneous matter being inimical to the Spirits is sometimes shaken off from the Brain into the trunks of the Nerves, and from thence by their passages and slips, if perhaps it shall be in very little quantity, without very great or sensible hurt slides down to their lower ends. And when it falls in the nervous fibres, and being heaped up daily, shall at length sensibly increase unto a great quantity, it begins to trouble the inmate Spirits, and to provoke them into asthmatical Convulsions; which forthwith infest, and are increased by reason of evident causes; neither do they utterly cease, untill the stock of matter so accumulated, be wholly dispers'd, and consumed; afterwards when it being renewed arises to a fulness, the fits of that disease return, and are for that cause most frequently periodical, as is manifest to common observation. According to this account we do deservedly suspect the cause of a convulsive asthma sometimes to lurk in the muscular coats of the pneumonick vessels, also sometimes in the fibres of the Diaphragma, or the Processes thereof towards the loyns. It is not very probable that the nest of this disease consists within the fibres of this or that pectoral muscle, although in Scorbutical persons from these also possessed with a convulsive matter, we have known pains to have risen with breathing being hurt.

1. In the muscular fibres.

2. But truly (even as in another place we have not only demonstrated by reason, but by the observations and Histories of the sick) a convulsive asthma is often incurred, as often as the morbid matter sliding down into the pneumonic Nerves, sticks in

2. Within the Nerves and their infoldings.

some place within their passages, and especially about their foldings: whence as often as it is accumulated to a plenitude it begins to be mov'd and shaken; wherefore the spirits lying lurking, and flowing into the organs of breathing disturbed, are forced into irregularity, and those spirits presently affect other inmates of the fibres of the Lungs and breast, and provoke them into unequal and asthmatical convulsions. For this cause and the reason of the disturbance, we have declared that not only invasions of this disease, but also the precordia being disturb'd thereby the Cardiack passions do arise.

3. Near the Origines of the Nerves.

3. We have clearly unfolded by anatomical observations that the cause of a convulsive Asthma sometimes consists in the hinder part of the head near the origines of the nerves. Surely I have observ'd some patients, who when, lying sick of other desperate diseases, they were also asthmatick, found it necessary to be whether in bed or chair with their head always erect, or looking down, but lying on their back or leaning backwards incontinently they gaped for breath as if they were dying, and hardly breathed; the cause whereof (as appear'd by dissection after they were dead) was only a huge collection of sharp Serum which was gather'd within the cavities of the brain; which, if by reason of the head inclining backwards, it fell into the origine of the Nerves of the eighth pair, presently the precordia, and chiefly the breathing organs were affected with horrid cramps. Moreover sometimes for this very reason it seems that Orthopnoick persons cannot lie down in their bed without danger of choaking, but are constrain'd to sit up with an erect body.

3. A mixt Asthma or partly Pneumonic and partly Convulsive.

III. Although an Asthma is sometimes simple from the beginning, viz. either merely pneumonical, or convulsive, notwithstanding after either disease hath for some time encreased, for the most part it gains the other to it self: hence it may be concluded every inveterate Asthma to be a mixt affection, stirr'd up by the default partly of the Lungs ill fram'd, and partly by default of the Nerves and nervous fibres appertaining to the breathing parts. For when the pneumonic passages being straitened or obstructed from some cause, do not admit of a free sucking in, and breathing out of the air, for that cause also the blood, yea and nervous humour, being hindred in their courses, and compell'd to proceed slowly and to stagnate, do fasten their seculency and dregs upon the nervous parts; whence the passages of the spirits are obstructed, or perverted, and at length a convulsive taint accrues to them. Moreover the blood, being not duly inspir'd and eventilated within the precordia, at length being vitiated in its temperament supplies the brain and nervous stock but with a depraved juice, whose faults do chiefly punish the organs of respiration before hurt and debilitated. In like manner also the evil is reciprocated on the contrary part, as oft as this disease begins by fault of the nervous stock; for as much as the motion of the Lungs is often stopt or hindered, by reason of Convulsions in the muscular fibres, both the blood and the nervous juice being restrain'd from their usual motions, do heap up dregs and filths, fastening them to the parts containing them, by which not only viscous humours and obstructing of the passages, but even Tumours and other more solid concretes vitiating the structure of the Lungs, are produced.

The causes of an Asthma recited.

Therefore if when an Asthma being for some time confirmed and become habitual, shall attain to frequent fits, and those emergent upon every occasion; the conjunct cause thereof, and also the procuring cause is placed as well inwardly in the lung it self, as outwardly in the Fibres and Nerves, and in the spirits employ'd for the function of breathing. Neither will it be difficult, by seeking diligently each of these things, to find in any case of the patient, as well the chief nests, as nourishment of this morbidick matter. But as to the evident causes they are very many, and also of diverse sorts. For hitherto ought to be referred whatsoever move, either the blood and the other humours, or trouble the animal spirits and force them into irregularities. Asthmatical persons can indure nothing violent, or unaccustomed: from excess of cold, or heat, from any vehement motion of body or mind, by any great change of air, or of the year, or from the slightest errors about the things not natural, yea from a thousand other occasions they fall into fits of difficult breathing.

The Prognosticks of the Disease.

As to the prognostick part, an inveterate Asthma is difficult or scarce ever cured; notwithstanding the medicines and method of healing being rightly ordered, oftentimes great succour is afforded, viz. the fierceness of the fits is diminish'd, longer respites are procured, yea, even the dangers of life it self, seeming frequently to be imminent are removed.

This disease growing worse, either threatens a Consumption, or a Dropsie, or some drowzy,

drowzy, or convulsive affect; accordingly as the Serum by reason of perspiration being hindred, being more abundantly accumulated (because the sick cannot sleep enough in their beds) it is either fixed in the lungs, or transfer'd into the habit of the body, or into the brain it self. For this very reason the diseased do find themselves better in Summer, when they breath more freely, than in Winter; likewise better in hot countries than in cold, the South or West wind blowing, than the North or East.

Of the curatory method of an Asthma there will be two chief indications, or rather so many distinct methods of healing, viz. Curatory and preservatory. The first instructs what is to be perform'd in the fit it self, that the Patient may be delivered from present danger; the other, by what out of the fit, we ought to endeavour the taking away the morbid cause, lest that distemper be repeated more often, or more heavily.

Two chief Indications.

1. Therefore a fit urging, there will be two chief intentions of curing, viz. first, that a more free breathing be procured, as well upon the account of air, as of the Lungs, at least so far, as may suffice to support life; and secondly, that the organs of breathing may be withdrawn, and restrain'd, as soon as may be, from the Convulsions begun, and usually obstinately continuing.

What is to be done in the fit.

1. As to what respects the former, let the Patient be placed in an upright position of body, in a more open place, and pretty airy, free from Smoak and breath of by-standers; then let it be endeavour'd that the Lungs, being made free from all obstruction, and inward oppression, and also external compression, may be able to draw and change the breath more easily. For these purposes lest the bulk of the nether bowels compress or straiten the precordia, the belly is to be loosen'd by a Clyster, the apparel and what ever binds about the Breast to be loosened; also when in this case either from the blood swelling up inordinately within the Pneumonic vessels, or from the Serum distilling out of the Arteries and Glandules into the tracheal passages, they are wont to be oppressed, the impetuosity and instigations of either humour ought to be restrain'd and appeased; insomuch that if strength endure, and the pulse be strong enough, Phlebotomy is oftentimes convenient. Moreover those things are carefully to be administred which dispatch away the Serum and superfluities of the boiling blood by urine, as well as sweatings: to which intention, Juleps, Apozemes, commonly call'd Pectorals, do notably conduce; yea, powders of shells, mellepedes prepared, Spirits and volatile salts, are successfully used. In the mean time besides let there be administred whatsoever opens and makes slippery the passages of the Trachea, and moves expectoration, and whatsoever, if need be, gives stop to a Catarrh distilling upon the same; for which purposes, Lambitives, Lohochs, pectoral Decoctions and fuffumigations are good.

1 Intention to facilitate breathing.

2. As to the other intention of curing in these Convulsive fits, viz. that the organs of breathing may be restrained from the Convulsions begun, and may quietly return to their ordinary task, (unless this succeeds of its own accord, after the boiling of the blood and Serum in the Lungs be appeased) we must use Antispasmaticks or remedies against Convulsions, and Anodynes: for medicines which are used to be administred in hysterical passions, do conduce in a convulsive Asthma.

2 Intention to free from Convulsions the moving parts. Remedies which dissipate the spirits profit for this end.

Spirit of Harts-horn, of foot, and especially of sal Armoniac distill'd with gum Ammoniacum; also the tinctures of gum Ammoniacum, of Sulphur, of Castor, of Afa fetida, Syrups of Ammoniacum, Sulphur; Oxymel of squils and such like, which because they are of an ingratelous tast or smell, as it were dissipate the spirits and withdraw them from tumults, do sometimes help notably. But if the spirits being outrageous cannot by this means be appeased, we must assay Narcotics, that some of them being subdued the others may be reduced to order: for surely unless a stuffing up of the Lungs, with a great oppression of the Precordia do hinder, Opiates do sometimes greatly profit. In the dreadful fits of this disease, when other medicines had effected less, I have often administred successfully Diacodium, as also Laudanum Tartariz'd. But these may not be exhibited without great circumspection, because whereas more or less they hinder breathing (which already is difficult and too much hindred) they frequently bring the Patient into danger of life. Besides this, that the Pneumonic spirits may be diverted from their Convulsions, it is many times expedient to molest the spirits in other places; for some of the spirits being in other places afflicted most commonly the residue as well as those that are smitten do diminish their irregularities: Wherefore Vesicatories, Cupping-glasses, ligatures, and painful frictions bring help;

Or do bring them asleep.

help; also for this reason vomits are successfully taken in the midst of a fit. The scope of healing being now design'd, after what manner the patients in an urging fit of an Asthma ought to be handled, it yet remains for us to propound some more select forms of Remedies appropriated to the same ends.

Forms of Remedies.

In the first place therefore to give a stop to the flux of blood and serum, and to dismiss their superfluities deriv'd from the Lungs by sweat and urine, these ensuing are prescrib'd.

Take the water of ground-Ivy eight ounces, of Rue, Pennyroyal, Dragons, of each two ounces, of sal prunella one dram and a half, Syrup Byzantinus, red Poppies of each one ounce; make a Julep, take it three or more times in a day, the dose three or four ounces.

An Apozeme.

Take grass roots three ounces, roots of Kneeholm two ounces, candi'd Enula campane one ounce and a half, barley half an ounce, Raisins of the Sun, one ounce, boyle them in three pound of water to two pound, adding to your strain'd liquor sal prunella one dram and a half; sweeten it, if there be occasion, with Syrup Byzantinus or of Violets.

A Tincture.

Take tincture of Sulphur three drams, the Dose six drops to ten, evening and morning in a spoonful of Syrup of the juice of ground-Ivy, or Violets.

Take of fecula of Aron and Briony, of each one dram and a half, flower of Sulphur one dram, flowers of Benzoin half a dram, Sugar-candy half an ounce, Liquorish two drams; make a powder to be taken to half a dram or two scruples twice in a day with the former Julep or Apozeme: or,

A Powder.

Take of the powder prescribed two ounces, hony or Oxymel what will suffice, make a Linctus, take about half a spoonful evening, and morning, and at other times lick it with a stick of Liquorish.

Take Syrup of Horehound, of Garlick of each one ounce and a half, tincture of Saffron, Castor, of each two drams mix them, take a small spoonful in the fits.

Mixtures.

Take of spirit of sal Armoniack with gum Ammoniacum three drams, of snail water, and of Earth-worms of each three ounces, Syrup of Horehound two ounces, mingle them, take by a spoonful once in four or five hours.

Take of the powder of Hedge mustard, or of ground Ivy gather'd in the heat of the Sun one ounce, of Oxymel simple enough to make a Linctus.

2 The Indication preservatory proposes what is to be done out of the fit.

Suggests two Intentions of healing.

2. So much concerning the method, and medicines requisite in the fit of an Asthma. The other indication preservatory designing the taking away of the whole procuring causes and the morbid matter, contains two parts or distinct scopes of cure: both which for the most part are wont in the practice to be complicated and administred together. One of these endeavours to amend the conformation of the Lungs, if it be any way hurt or faulty, and the other to take off the irregularities of the moving parts and spirits, appointed for them. We shall best answer both these intentions if the remedies vulgarly call'd pectorals, are mixt with anticonvulsives, and the use of these with other medicines respecting the preparation of the whole body and emergent symptomes be apply'd between whites. For which purposes the method and ensuing forms of remedies may be administred.

Forms of Remedies.

Take of Aloes rosata a dram and half, flower of Sulphur a dram, salt of Amber half a dram, Tar what will suffice, make 24 pills, take 4 every, or every other, or every third night. or,

Pills.

Take of gum Ammoniacum, Bdellium dissolv'd in vinegar of Squils of each half an ounce, flower of Brimstone three drams, powder of hedge mustard and savory of each half a dram, make a mass with Syrup of Sulphur or Oxymel of Squils; make small pills, take 3 every evening. or,

Take Hog-lice prepar'd two drams, flower of Benzoin half a dram, salt of Amber two scruples, extract of Enula campane half a dram, Castor half a dram, Saffron a scruple, Venice Turpentine enough to make a mass, form small pills, take 4 every evening and morning except the times of purging.

But if this form of Pills will not please, or the above mentioned Medicines profit little, afterwards the ensuing shall be essay'd to free the Lungs from obstruction.

Take

Take Spirit of gum Ammoniacum distilled with sal Armoniac three drams, the Syrup of Mixture Ground-Ivy three ounces, magistral Snail and Earth-worm water of each an ounce, tincture of Saffron two drams, mingle them and take a spoonful evening and morning. Or,

Take Tincture of Ammoniacum three drams, the dose from 15 to 20 drops in a spoonful of Oxymel, or of Syrup of Ground-Ivy. Or,

Take Tincture of Sulphur three drams, dose from 7 drops to 12 or 20 in a convenient vehicle at the same hours.

In like manner other spirits endued with a volatile salt, and mixt with pectoral Syrups and Cephalick waters, may be prescribed successfully evening and morning.

In place of a mixture or an Asthmatical Julep from distill'd-waters in the shops, let this following magistral be prepared for frequent and several uses.

Take roots of Enula campane, Orris of Florence, Angelica, Masterwort, of each a distill'd water four ounces, of Bryony a pound, the leaves of white Hore-bound, Hyssop, of Savory, Penny-royal, Ground-Ivy of each four handfuls, Juniper and Ivy-berries of each a pound, Bay-berries half a pound, Sweet Fennel, Carue, Annis, Lovage, Dill seeds of each an ounce, Cubebs two ounces, Long-pepper, Cloves, and Mace of each an ounce, all being sliced and bruised pour on them eight pound of Brunswick beer, distil it in common organs, mix the whole, and as you use it sweeten it with Sugar, or Syrup of Ground-Ivy, or with Oxymel.

Moreover in lieu of Oxymel, or any common pectoral Syrups, the ensuing forms of medicines appropriated to an Asthma are prescribed; and in the first place the Syrup of Enula-campane invented by Horatius Augenus and called by his name, and afterwards commended by Platerus, Sennertus, Riverius and other renowned Practitioners, ought to be observed in this place, and used frequently.

Take of Enula-campane, Polypodie of the Oak prepared of each two ounces, Cur-Magistral Sy-
rance two ounces, Sebestens 15, Coltsfoot, Lungwort, Savory, Calamint, of each a
handful, a large leaf of Tabaco, Liquorish two drams, Nettle and Silk worm seeds of each
a dram and a half, boyl them in Wine mingled with Hony and diluted to a pound and half,
and with a little Sugar make a Syrup: take it by it self in form of a Linctus, or a spoon-
ful evening and morning, or add a spoonfull to the distilled water or Apozeme.

Take Florence Orris-roots, Enula campane of each half an ounce, Garlick peel'd four
drams, Cloves two drams, white Benzoin a dram and half, Saffron a scruple, slice and
bruise them and digest them warm in a pound of rectified spirit of Wine for 48 hours; to it
strained add fine Sugar a pound, put it in a Silver Bason upon live coals, stirring it till it flame,
and let it burn as long as it will, then the flame being out make a Syrup of it to be taken as
the former.

Moreover hither may be referred the decoction of an old Cock so much magnified by renowned Physicians as well antient as modern, for the cure of an Asthma; which although Septalius damn'd for gross and of no efficacy, notwithstanding Riverius after him vindicates; and to attest the efficacy of this remedy opposes his own experience to the others. These broths are of two kinds, viz. either with or without purgers; and various Recipes of each do remain in practical Authors, all which would be tedious to recount here, we shall propose one or two forms.

This is the common example without purgers.

Take of Orris and Enula-campane-roots of each half an ounce, Hyssop and Hore-bound
dried of each six drams, Carthamus seeds an ounce, Annis and Dill seeds of each two drams,
Liquorish scraped and Raisins stoned of each three drams; let them be prepared and sewed
into the belly of an old Cock, which boyl in fifteen pound of water until the flesh depart from
the bones, strain it and let it settle: of the clear liquor the dose six ounces, with an ounce
of Oxymel simple. Or if the remedy be desired to be solutive, dissolve of fresh Cassia and
Manna of each half an ounce in each draught, taken for many days together, and sometimes
for a whole month.

Riverius prescribes a convenient form of such a kind of purging broth.

Take

Take Enula-campane and Orris roots of each a dram and a half, Hyssop and Coltsfoot of each a handful, Liquorish and Raisins of each two drams, Figs 4, Senna cleansed three drams, polypodie of the Oak and Carthamus-seeds of each half an ounce, Anniseeds a dram and a half, boyl them with the third or fourth part of an old cock, make broth for one dose to be taken in the morning, let them continue it for twelve or fifteen days.

*The first History
of a Convulsive
Asthma.*

Of many examples of Asthmaticks I shall propound only two singular ones, viz. I will describe the History of one who hath been obnoxious to fits of this disease meerly convulsive, and of another partly convulsive and partly Pneumonic. A Noble person, proper and well set, and formerly healthful enough, after that by chance he had struck his side against some solid body, from that time contracted a hurt, and afterwards an Asthmatical taint. For we may suspect, a certain folding of the Nerves belonging to the precordia placed near was prejudiced by that accident, and from such a cause afterwards this distemper derived its origine, viz. at some incertain times the pain at first troubled him about that place, and presently a most painful Dyspnœa ensued with a laborious and lasting contention of all the breathing parts; insomuch that while the fit lasted the patient was thought to be in the agonie of death. I was first sent for to him after labouring for two days with such an invasion of the Asthma that he was accounted in a desperate condition; Notwithstanding finding his Lungs without hurt, our prognostic willed as yet to hope well, and immediately by a consultation of other Physicians it was prescribed as followeth.

The Cure.

Take of spirit of gum Ammoniacum distill'd with salt of Tartar three drams, take from 15 to 20 drops in a Spoonful of the following Julep, drinking after it five Spoonfuls, repeat it every sixth hour.

Take elder flower, camomile, and Penyroyal water of each four ounces, Snail water two ounces, Sugar one ounce, mingle them, between whiles he took a dose of the following powder with the same Julep or pectoral decoction.

Take powder of Crabs eyes two drams, sal prunella a dram and a half, salt of Amber half a dram, mix them, divide it into eight doses.

Large vesicatories were applied on the inside of his arms near the arm-pits, Clysters daily administred, and frequent frictions. By the use of these he received sudden and unexpected help, and within a few days became wholly free from that fit. Afterwards as often as he had any perception of the first motions of this disease, presently he took a large dose of that spirit with the same Julep 3 or 4 times a day, by which remedy often used, one while for preservation, another while for the cure sake, he was void of any outrageous invasion from his habitual Asthma for above two years, in the mean while suffering some more light assaults but easily blown off.

*The second History
of a mixt
disease.*

A very Honourable old Gentleman dignified by many great Titles, himself being greater than all them, after that for some years he had liv'd every winter obnoxious to a cough and a moderate spitting, and gentle enough, at the end of the last Autumn returning from a long journey he was less healthful: (as it was thought by cold he had taken) for he complained of a pain in the middle of his breast next the sternon, which growing worse in an evening, as soon as warm in his bed, wholly disturbed his sleep, and most part of the night was very troublesome: notwithstanding without any Dyspnea or evident sign of an Asthma. To take away this pain both Purging and Bleeding were used, pectorals and antiscorbuticks were daily used, liniments and fomentations were applied to the place pained, yet without any great success or ease: for the alteration which happened afterwards declined rather to worse; for a difficult and obstructed breath came upon the pain's growing a little more remiss, so that from his first sleep, or inclination thereto he became asthmatical and gaping for breath, and suffering about the precordia he was constrained to sit upright in his bed. Moreover a dyspnœa of this kind and a convulsive agitation of the breathing parts did not only return every evening, but from day to day were rendred more outrageous and lasted a longer time; insomuch that one night waking from his sleep, for many hours he was assaulted with a most painful fit of an Asthma which had almost kill'd him. The Physicians being at a great distance from him, although desired about midnight came not while the morning following, mean while by reason of bleeding used by a Barber this worthy Gentleman revived, being redeemed from the jaws
of

of death; but afterwards by the consultations of Physicians that day a slender diet and loosening the belly by a Clyster were prescribed: In the evening and early in the morning he took of Spirit of gum Ammoniac distilled with sal Armoniac 12 drops in a proper vehicle, and continued the use for many days after; Vesicatories were applied on the inside of his arms near the armpits; moreover Juleps and pectoral Decoctions, Lohochs, Clysters, and also mild Purges were taken by turns; also Phlebotomie was repeated after two days. Whereas formerly he was used to drink for his mornings draught a pint of Ale with Wormwood and Scurvy-grass, in the room of that about eight a clock he took 15 drops of Elixir Proprietatis tartariz'd in a draught of Coffee made with Sage. By these remedies his asthmatical fits presently abated of their fierceness, insomuch that the beginning and end of every night were quiet enough, but in the middle light troubles about the precordia kept him from sleep, sitting upright an hour or two. Certain other medicines were propounded by the Physicians, and others of diverse sorts privately offered by his friends, which notwithstanding the Honourable Person utterly rejected, or soon loath'd; and that the rather, because, winter then being almost spent, his restauration was hoped for by the coming on of the Spring and enjoyment of the Country air without the help of much Physick. Wherefore of the medicines above mentioned he used one while this and another while that a little by turns, and sometimes kept holy-day from them all; but in the interim although his asthmatical invasions little or nothing troubled him as formerly in the night, yet by reason his Lungs were very much obstructed, and a serous humour fallen down into his feet, he was not able to walk fast or ascend steep places, without a painful dyspnœa, being in danger of choaking; and now (while I am writing this) not so much an Asthma or Consumption, as a Dropsie is feared.

The Ætiologie of this case is clearly enough manifest from the above-mentioned things, *viz.* one procuring cause of this Asthma was a lung greatly obstructed, insomuch, that whereas the blood boiling, passed through the precordia more impetuously, the air requisite for its ventilation could not be admitted in plenty enough; wherefore to supply this defect there was necessity that the Lungs and their motive organs should be provoked into more frequent, and more vehement throes. Afterwards from thence ensued a convulsive disposition of the fibres moving the breast: for the heterogeneous matter descending into those parts together with the nervous juice, and being gathered to a plenitude, first excited pain and afterwards fierce and periodical convulsions in the pneumonic organs: and now although this latter disposition cease (because the Elastick and spasmodical matter is blunted or extinguished by the serous illuvies) yet the other procuring cause still remains, and hath got another associate, *viz.* a worse Devil than it self, to wit a Dropsie.

*The reason of
this case.*

SECT. I. CHAP. XIII.

Of a Dropsie of the Breast.

A Dropsie of the Breast is easily known.

IT is clearly manifest by certain and manifold discoveries, that the Region of the Breast is sometimes affected with a Dropsie; for the sense and sound of water fluctuating, do most evidently demonstrate it in living bodies; and Anatomical inspection in the defunct. But yet concerning the cause of this Disease, and manner of coming to pass, to wit, by what ways, and after what manner disposed, the accumulation of water first begins within the hollow of the breast, as also how it is sensibly augmented, and frequently insensibly continued untill the Disease becomes desperate, is a thing yet in the dark. Whenas there is a general distemper of a Dropsie or an Anasarca appearing, and hath seized on the flesh and cavities of the bowels every where, or in most places, we are not to admire if that illuvies of waters seize also upon the Pectorals: But besides, sometimes it happens, that the Region of the Thorax, is either first or only overflown, the other parts in the mean time remaining found enough, or only hurt secondarily.

Its cause is hidden.

About the origine of this Disease, and the manner of generation it is much disputed whence, and by what passages that illuvies of water being found every where in the hollownes of the Thorax, doth come thither. Some Authors do derive it from above, *viz.* that it descends from the head by the Trachea; and others deducing its Spring from beneath, from the cavity of the Abdomen, also sometimes from the Liver and Spleen, by I know not what blind ways, judge those waters to be conveyed into the hollownes of the Breast. But neither of these Opinions challenge our assent, or deserve our arguments to disprove them: for none considering the passage of the blood and humours will acknowledge either this or that way of commerce. We cannot but affirm, that the ferous humour, raising a Dropsie of the breast, does arrive thither either in a kind of vapour, which being exhal'd from the Precordia and sides of the Thorax, is easily condensed into water; or secondly, that the Serum is there deposited under its own proper form, inasmuch as it flows into that cavity from the mouths of the Vessels, *i. e.* of the Arteries being open. We will anon enquire whether the Lymphaducts or vessels bringing chyle, being any where open, or broke, do sometimes produce that disease.

How many ways it may be produced.

1. By Vapours condensed there.

1. As to the former, it is so very probable that a Dropsie of the breast takes sometimes its origine from vapours condensed within its cavity, that it is a wonder how it should be otherwise at any time, or that any should live exempt from such an effect. For how much is there of vapour that separates from the boyling blood? and when it waxes cold in the precordia, how can it come otherwise to pass but that the abundant vapour should be condensed in this enclosure into water, even as if shut within a Still? And truly it will not be easie to determine, when the vaporious steams are so uncessantly heaped within the cavity of the breast, what may become of them, how they are consumed, or from thence discharged abroad. Surely we must affirm, they either penetrate the sides of the Thorax, or (which rather seems to be) they insinuate into the pores of the Lungs, and so fly away in breathing. Certainly by either way, the vapours of the breast may exhale: and perhaps if either be defective, or hindered, by that means a Dropsie of the Breast may be caused.

2. By Serum deposited there.

2. But moreover, I am apt to think, that this Disease also sometimes happens in another manner (inasmuch as the Serum distills from the vessels in its proper form.) For in a cacochemical constitution of body, or a person very scorbutical, where the watery and weak blood every where casts off its superfluous Serum from its own consistence, and every where ejecting it from the little mouths of the Arteries being loosed and open, excludes it from the clew of circulation, nothing is more usual, than for the cavities not only of the Bowels, but also of the Precordia, yea the Brain it self, to be overflown with that watery collection; moreover in so general a disposition to a Dropsie, that one while this region, another while that, or another should be first and almost onely possess'd; and that also sometimes the inmost parts being untoucht, the

Which sometimes breaks out from the Arteries.

the outward flesh, viz. the muscles and their interspaces are overflown with that serous illuvies.

3. Among the vessels that pour in the dropical matter into the cavity of the breast, the Lymphaducts and parts bringing the chyle, do justly fall under a suspicion. What relates to the former, it appears by anatomical inspection, that a great company of these do creep thorough the whole Lungs, and do tend from their outer parts, stretching out themselves inwards towards the passages of the breast, and for the most part pour out into them their liquour, which being superfluous, they every where suck up from the arterious Blood. Therefore whenas these vessels are obstructed, or are by any means impeded from discharging their function, it must needs be that a heap of water be accumulated in the Lungs, which afterwards falling into the cavity of the breast, will excite a Dropsie in that region. For in truth, this Lympha reſtagnating within the consistence of the Lungs, it often happens that the little bladders called Hydatides, in the outer superficies of the Viscera are raised up, which afterwards being broke, discharging the waters into the cavities of the Thorax, they produce there an Ascites. A distemper of this kinde is often discovered in Sheep, when they dye by heaps of a Dropsie, by reason of a moist season and watery pasture. And surely the following History doth clearly seem to argue, that the Ascites of the breast proceeds from the like cause sometimes in a man, (there being yet a living example of this disease.) Lately a young man healthful enough and strong, having accustomed himself to hunting and insatiable riding, and other exercises of the body very immoderate, a while without detriment, at length he perceived a fulness in his Thorax as if it were a kind of swelling; insomuch that the left side of his Lungs seem'd to begin to swell, and his heart to be thrust out of its place towards the right side; for that he perceived the pulsation thereof to be on that part chiefly. After he had been for some time in this condition, on a certain day he felt as if a Vessel had been burst asunder within the cavity of the Thorax, and from thence for the space of half an hour, in that place, as it were the dropping of a humour falling from above into the bottome of his breast, was not only felt by himself, but could be heard also by the standers by. Although he was at first surprized with the rarity of this affect, yet for that he was well enough as to strength, appetite, sleep, and other natural functions, immediately after he became secure, and negligent of Medicines; But afterwards by any motion, bending or stirring of his Body, a fluctuation of water gathered within on his left side, was felt by him; moreover, the motion and sound was evidently perceived by others, either by handling, or by the ear. As without doubt this Gentleman was affected with a Dropsie of the Breast, so it seemed most probable that the disease had its original from thence, in regard the lymphaducts relating to the left side of the lungs, being first obstructed near their insertions into the passage bringing the chyle, did swell up to a great bulk, and afterwards being broken distill'd their humour into the cavity of the Thorax.

3. And sometimes from the Lymphaducts.

A remarkable history of the like case.

When now an Inundation of the Precordia, and so of the vital Fort, was imminent, this Gentleman at length, thinking it time to provide for himself, entered into a course of Physick, and carryed certain Medicines into the Countrey for his cure, yet without any signal success. Afterwards coming to London, he first consulted the worthy Dr. Lower, being of his former acquaintance. He proposing the opening of the Thorax for his only remedy, took care that the worthy Dr. Micklethwait and my self should be sent for to the consultation. Immediately an incision was appointed by the consent of us all: wherefore, after provision for the whole being made, a Chirurgeon applied a Cautey between the sixth and seventh Vertebra, and the next day he put his Pipe into the Orifice cut into the cavity of his Breast; which being done, immediately a thick liquor whitish like Chyle, and as it were milkie, flowed out. There was about six ounces only taken from him the first time, and the next day as much more. The third day when a little greater quantity was suffered to come out, being affected immediately with great fainting, and afterwards being feaverish, he was ill for a day or two. Wherefore it seemed good to stop the issue of that matter till he recovered his temperament and strength: but afterwards a sparing evacuation of the same matter being daily made, the cavity of his breast was wholly emptyed: but as yet he wears a pipe in the orifice with a tap, which being opened once in a day and a nights space, a very little of the humour flows out; in the mean while, being well in stomach, visage, and strength, he walks abroad, rides, and performs all exercises he was formerly accustomed.

The reason thereof.

The cure by a Paracentesis of the breast.

customed to, vigorously enough. He used not (neither was there need of) much medicine, only after the Incision we advised temperate Cordials, *viz.* powder of Pearles, Juleps, and sometimes Hypnoticks, and afterwards a vulnerary decoction to be taken twice a day.

By this method, and these forms of Medicines sometimes continued, this worthy person seemed to recover his temper, and his strength, and the habit of his body, and his breast exempt from the Dropsie. Notwithstanding he still wore a silver Pipe in the orifice of his side (out of which ichor daily flowed): and when after some months this being withdrawn, the Issue was shut up, a gathering of the same humour was made within the hollow of his breast, perceivable by the sound and fluctuation thereof: but when that the disease returning, the same medicine was to be used, and incision of his side appointed, (Nature by chance discharging the function of a Chirurgeon) the matter being prone to burst out, and flowing to the place made its own way. He is now necessitated (for preventing the illuvies of his Breast) to keep that orifice constantly open like a sink.

From these things I think it manifest enough, that an Ascites of the Breast, sometimes arises from the lymphatick vessels burst asunder within the Lungs; neither doubt I less but that the same affection may be caused from the chyloferous passages being broke within the Thorax; notwithstanding, this chance so rarely happens, that as yet I have not known it by my own observation, or others relation. Moreover, it little avails to make inquisition into the *Ætiologie* of such a disease, because it is not only apparently incurable, but in a short time mortal; because the Precordia are incessantly overflowed by the inundation of the chyle, and also the blood and the animal spirits being defrauded of their wonted supply of nutritious Juice, are immediately dissolved.

*The differences
of this disease.*

From the various causes of this Disease even now set down, it will be easie to collect its differences: For first a Dropsie of the Breast, is either simple and primary, peculiar to this Region; or secondary, coming upon a general Dropsie, as it is wont often to be in cachectic persons. Secondly, this Disease is distinguished as to the places affected, *viz.* forasmuch as water is either collected in the whole breast, or only in one side thereof. Thirdly, as to the matter accumulated in a pectoral Ascites, which one while is limpid and plainly waterish, another while more thick, whitish, and as it were milkie, such as we have described in the foregoing History.

*The Diagnostick
signs.*

The diagnostick signs do manifestly enough discover this disease: *viz.* the fluctuation of water is perceived by handling, and by feeling at every bending of the body, and the sound is clearly heard. Moreover they are affected much with a dry and empty Cough, as also with a Dyspnea almost continual and painful, especially while they ascend steep places; Besides, they have a thirst, with a little fever, and in the night after the first sleep, great disquiet and tossing of the body, proceeding from the vapours being elevated by the heat being more intense. Sometimes there comes upon these a Palpitation of the heart, an intermitting or disturbed Pulse, and frequent faintings of the spirit. As to the prognostick, this disease is always difficult to cure, and among the vulgar accounted incurable. And surely if it come upon an Ascites of the Abdomen or an Anasarca throughout the whole body, it is judged not without cause desperate; But if the affection be primary, and happen to a body otherwise sound, we are not altogether to despair of Cure.

The Cure.

What relates to the curatory part of this Disease, the chief Indications will be three, Curative, Preservative, and Vital, according to the common method of curing in most other Distempers.

The first has regard that the water heaped up in the cavity of the Breast by any means be evacuated. The Second provides, that afterwards a new illuvies be not gathered in the same place. The Third procures the restoration of strength, and the symptoms impairing it to be removed with expedition.

*What Intentions
of healing the
first Indication
suggests.*

To satisfy the first Indication, and that an Ascites of the Breast may be emptied, there are but two ways or means of evacuation to be met with, whereby this collection of waters may be drayn'd, *viz.* Either that the vessels of the Breast, and the passages of the humours, being emptied, might suck up that Lympha being rarified, and afterwards by the passages of the blood or air convey them forth: or secondly, that by an incision of the side, those waters may be drained forth plentifully in their own Species.

That

That former manner although more ſeldom, yet ſometimes ſucceeds; which I can attelt out of my own obſervation. For the conſiſtence of the Lungs being ſpongy within, and externally very porous, while by every turn of the Diaſtole, they are drenched in the underlying waters, they ſometimes imbibe them being turn'd into vapour; and ſo diſpatch them to the blood, or continually exhale them with aire coming out at the mouth. That an effect of this ſort may more eaſily happen to cure this diſeaſe, medicinal aids are taken: For that intention therefore the paſſages of blood, aire, and humours ought to be emptied as much as may be, and to be kept ſo empty. For this purpoſe, Purges, Diureticks, and more mild Diaphoreticks are methodically, and alternately exhibited; alſo remedies for the brealt; and expectorating, challenge here their place; let the Diet be ſlender and warming, and a government appointed as to all other things of that nature, that the blood may be made to exhale the more, and all the ſuperfluous humours to evaporate. I think good to annex ſome forms of Medicines accommodated to theſe uſes.

The firſt Intention.

Take of Chervil-roots, Knee-holme, Polypodie of the Oak, of each an ounce, Agrimony, A Purging Hy-
white Maſdenhaire, Oak of Jeruſalem, Ground Ivy, of each one handſul, Carthamus-
ſeeds one ounce, Florence Orris half an ounce, ſeeds of Danewort 5 drams, Calamus Aro-
maticus half an ounce, boyl them in four pound of Spring-water, to the conſumption of
a third part, adde to it being ſtrained Senna one ounce and a half, Agarick two drams,
Mechoacan and Turbiſh, of each half an ounce, yellow Sanders a dram and a half, Ga-
langal the leſs one dram, boyl them two hours gently, and cloſe covered, afterwards ſtrain it
and adde of Honey two ounces, clarifie it with the white of an Egge, make a purging Hy-
dromel. The Doſe is from ſix ounces to eight, in the morning, twice or thrice in a
week. Or,

Take Mercurius Dulcis one ſcruple, Reſine of Fallap half a ſcruple, Baſam of Peru
what ſuffices to make four Pills, to be taken in the morning, and to be repeated within
five or ſix dayes.

Take Tincture of Sulphur three drams, take from ſeven drops to ten, at night and in
the morning, in a ſpoonfull of the following mixture, drinking after it three ſpoon-
fulls. *Tinctures.*

Take of the water of Snails, Earth worms, and compound rhadiſh water, of each four
ounces, water of Elder-berries fermented one pound, Syrup of Juice of Ground-Ivy two
ounces, mix them for a Julep. Or,

Take of Tincture of Ammoniacum, or Galbanum, take twenty drops evening and morn-
ing in the ſame mixture. Or,

Take of Hog-lice prepared two drams, flower of Sulphur two ſcruples, flower of Ben-
zoen one ſcruple, powder of wild Carrot and Burdock-ſeeds, of each half a dram, Turpen-
tine of Venice, enough to make a maſs. Make ſmall Pills. Take four evening and morn-
ing, drinking after them a ſmall draught of the Julep.

At Nine a Clock in the Morning, and Five in the Afternoon, let him take four
ounces of the Compound Lime-water, by it ſelf, or with any other proper remedy. *A Lime-water.*

For ordinary drink take the following Bochet.

Take Sarsaparilla ſix ounces, China two ounces, white and yellow Sanders, of each
ſix drams, ſhavings of Ivory and Hartshorn, of each three drams, Calamus Aromaticus
half an ounce, Raiſins half a pound, Liqueuriſh three drams, boyl and infuſe them in twelve
pound of Spring-water to ſix pound, ſtrain it. *A Bochet.*

Formerly about twenty five years ſince, when I reſided at Oxford, I was ſent
for to a young Scholar, who ſuffered for three weeks ſpace under a pain of the
Thorax, and a moſt grievous Dyſpnoea conſtantly troubling him in the evening,
moreover, from a more quick motion of body, or going more haſtily than uſually
up any ſteep place, he laboured extreamly, he could not ly down long on either
ſide, but was neceſſitated to lye in his bed ſupine, and his head erect; if perhaps
he attempted to lye on either ſide, immediately pain followed that poſition of bo-
dy, and if perhaps he roll'd himſelf from one ſide to another, the pain being alſo
preſently tranſlated, he felt as it were water to wave from place to place. Hence
I had a juſt ſuſpicion of a Dropſie of the Brealt, whereof that I might be more aſſu-
red, I order'd that lying upon his back on his bed, he would ſuffer his head to
bend backward from the bed-ſide to the floor, immediately he had a plain perception
of *A Hiſtory of a Patient.*

of water running towards the Clavicles, together with a change of the pain thither. Moreover if at any time he grew more hot than usual, from motion, or in his bed, or by the fire, he presently felt sensibly in his breast, as it were water boyl- ing over the fire, and also complained of a Vertigo, and a small decay of Spirits. Wherefore, when we might lawfully collect out of these things rightly considered, that he was affected with a dropsie of the breast, I prescribed the following method and medicines with success.

The Cure of him.

Take of Mercurius Dulcis fifteen grains, Resine of Gallap half a scruple, Syrup of Roses solutive what suffices, make three Pills. He took them early in the morning and had twelve stools with great ease; afterwards on the third day by the same Medicine he had but four, but with greater benefit; he took afterwards for many dayes six ounces of the Pectoral and Diuretick Apozeme twice in a day, and lastly repeating the Purge he perfectly recovered.

SECT.

S E C T. II.

Of Splanchnick remedies, or those which respect the bowels of the lower Belly.

C H A P. I.

Of the Jaundies and the remedies thereof, and the manner and reason of their operations.

Hitherto we have largely enough unfolded the Pathologie and curatory method of the Thorax; now it follows next to finish our task in like manner about the lower Belly. But we have in our former tract for the most part described already the medicines belonging to this region, and the manner and reasons of their working, together with the Anatomy of the Stomach and Intestines: we have treated of remedies stomachical, dysenterical, and others belonging to the intestines, as also diureticks together with the reasons of them: Moreover we have sufficiently elsewhere handled the ætiologie of Hypochondriack, and Hysterical remedies. What therefore remains, of Hepatical distempers as well proper, as of those vulgarly ascrib'd thereunto, and of their remedies we will discourse in this Section; notwithstanding in each of these, we will bestow more labour, about the curatory, than pathological part.

The chief diseases by which the Liver and the appendix thereof, are wont to be incumbered, are the Jaundies, and a Tumour, and under this latter many other affects, *viz.* obstruction, inflammation, induration, and schirrus are numbred; to all which are vulgarly appointed remedies commonly called Hepaticks, and which make up a great part of the Dispensatory. *Diseases of the Liver.*

The Jaundies is either a disease by it self, primarily beginning, which is here properly treated of: or it is an effect or product of another disease; as when it arises upon an intermitting Fever, which oftentimes it puts an end to, of which also we will presently treat by the by.

An Icteric distemper by the common consent of most is judged to arise in as much as the yellow choler, not at all, or not enough received, from the ends of *vena porta*, into the passages of the cholerick pore, overflows into the mass of blood and pollutes it with its greenness, whereby also the very skin is discolour'd. *The Jaundies.*

That obstruction is wont to happen after many manners and in various places. *The cause of it.* For sometimes it happens near the extrem ends of either kind of vessels, *viz.* the end of the *vena porta*, and the *porus biliaris*; the interspaces whereof happen frequently to be compressed, and stop'd by reason of the Parenchyma of the Liver being tumefied, or otherwise vitiated; wherefore the humour of the gall not being transferred out of the separating vessels of the *porta* into the other receiving vessels, turns back upon the blood. Secondly, the passage of the humour of the gall is sometimes intercepted in the middle passages of the cholerick pore; for that the cavities of these are filled either with a viscous, or sandy, and sometimes with a stony matter; as is plainly discerned in the Livers of beasts in the winter season, while they are fed with hay and straw. Thirdly, it is also manifest by Anatomical observation, sometimes an obstruction in the very bladder of the gall, or in the cystic passage is the cause of the Jaundies; for if at any time, it being filled with stones, receive not the choler, or being here shut up, or grown together, it restrains the descent of the choler towards the guts, that humour although well separated from the blood, is constrained to flow back into the mass thereof, and so propagates the Jaundies.

Against this most received opinion, by which it is judged, that the cause of the Jaundies for the most part consists on this side the *vesica felleis* or about it towards the Liver: the most Renowned Sylvius altogether places it without this, *viz.* in the Cystic *The opinion of Sylvius of the cause of the Jaundies.*

Cystic or common passage. For supposing the choler not to be separated from the blood, within the passages of the Liver, but in the very bladder of the Gall to be propagated of a humour brought thither by the Arteries; He judged the greatest part, being carried upwards by the passage of the *pori bilarii*, to be poured into the blood for some notable uses, and also another part to descend beneath to the Intestines, also for necessary uses: wherefore if this latter sluice be shut, all the choler is carried upwards into the blood, and filling it too much with this humour, perverts it from its genuine temper, into an Icteric.

But truly lest the stopping of the passage of the bladder, or of the common passage, (neither of which easily happens, or from any light occasion) may seem less efficacious to excite any Jaundies; therefore, *whether such an obstruction hath place, or no*, the most Renowned man ingeniously supposes besides, *The choler while it is generated in the bladder does undergo sometimes a notable change, by which it is moved, and is born about more plentifully and impetuously, towards the blood; with which yet it is less mingled than it was wont to be, but only confounded together with it, and so more easily departs from it and infects and tinges the solid parts with its colour.*

But that the choler in the Jaundies may be rendered unfit to mix with the other humours, or to be nearly united; he determines it to be done, by a spirit too volatile, mixed plentifully with it, and so making it more spirituous and immiscible with others. He confirms this assertion by two instances, viz. in as much as the most spirituous poison from the biting of a Viper, and the too much use of the more generous drinks, viz. Wine and Strong-waters, causes sometimes the Jaundies. Moreover he endeavours to procure credit to this Hypothesis, for that this disease is wont to be cured, not only by medicines opening obstructions, but by them which blunt the force of a raging volatile salt (of which sort are the decoction of Hemp-seeds, also Venice soape with many other things of the same sort.)

The Authors
opinion.

The cause of this
disease some-
times in the
blood.

It belongs not to this place, neither is it to our purpose to descend to end this contention, nor dare I now rashly determine it (since it hath tired so many Renowned Wits of the Moderns) whether really the choler be made in the bladder of the Gall, or whether it be only separated from the blood in the Liver, the great organ of separation; I confess this latter opinion best pleases me. And weighing these things seriously I am induced to think the cause of the Jaundies to consist chiefly in this, that the choler being sever'd in the Liver, is not, by reason of the ways being obstructed, at all, or not enough conveyed to the bladder of the Gall, but that it must of necessity regurgitate into the mass of blood; notwithstanding in the mean while we deny not, but this affect may sometime arise (although more rarely) from the Cystic passage or common pipe being obstructed. But also we think the fault of the blood to precede in part and perhaps sometimes wholly for the morbid cause; when to wit from its sulphurous and fixt Saline Particles above measure exalted, the choler is more plentifully, or quicker generated in the mass of blood, than can be separated or discharged forth by the ordinary ways; wherefore this, separating every where from the blood with the Serum, is affixed to the solid parts, and impresses its tincture upon them. And without doubt it is for this reason that some poisons, and chiefly the biting of Vipers, and the daily use of more generous drinks, induces the Jaundies in bodies before sound, for whose cure sometime Phlebotomic, and medicines reducing the blood to a right temper, are wont to profit more than those opening obstructions. Moreover it seems for this reason, that a tertian intermitting Fever so frequently terminates in the Jaundies; for we may not suspect the passages of the Liver can be by any means obstructed, since in all fits, so great an agitation of the blood and humours, by cold, and heat, and such an evacuation of them happens either by vomit or sweat: and truly even as feaverish fits are caused, inasmuch as the sulphurous part of the blood being too much advanced, in the first place perverts the nutritious juice into a morbid matter, and afterwards being inflam'd consumes, and exterminates it; so when the fixt salt is at last exalted together with the sulphur in the blood, and for that cause meer choler is abundantly engendered, the feaverish enkindling of the blood ceases, by reason of the restrictive force of the fixt salt, and in place thereof the distemper of the Jaundies doth succeed. But as the blood being too much advanced to a sulphureo-saline distemperature causes the Jaundies in any, though least predispos'd to it; so in others very much disposed thereto, having the ways of choler obstructed & the sulphur of the blood being too much depressed, it produces a freedom from that disease; for I have known many cachectick and phlegmatick persons, to have been free from the Jaundies

dies, though they have suffered under obstructions and indurations of the Liver, as to most of its passages.

It is not worth our labour to make more ample disquisition about the ætiologie of this disease; as to what respects the cure, there will be three primary indications, all which (for what may be the chiefest of them, and first to be exhibited, for the most part is concealed) we shall prosecute together; wherefore the intentions of healing shall be, 1. That the obstructions of the passages or choler-bearing vessels be opened, if perhaps any shall be either in the *porus biliaris*, in the Cystic passage, or in any place about the Liver. 2. That the blood be reduced to its due temperament and mixture, lest it ingender choler above measure, or render it unapt to be voided. 3. That the strength may be sustain'd, and the symptomes chiefly hurting them may be withstood.

1. That we may satisfy the first indication, cathartic evacuations notably conduce, as well by vomit, as siege, whereby the choler's descending towards the intestines may be furthered, and vessels obstructed, by the great shaking of them, freed from their obstruction. 2. Sharp, bitter, salt medicines and others indued with a certain briskness ought also to be given, which provoke the motion of choler gathered in the Liver, and stagnating; hither also ought to be referred, what by similitude of substance, and as it were signature, in as much as they are indued with a yellow juice, have the report to help against the Jaundies; notwithstanding many of these may fitly be numbred under the same classis of evacuators, as the former, because they move urine or sweats.

The second indication altogether requires alteratives, *viz.* medicines which may depress the exaltations, or ragings of the Sulphur and fixt salt, and in the mean time provoke the restitution of the volatile salt depressed; for these ends remedies endued with an acid or volatile salt, besides chalybeats do principally bring help; from hence spirit of salt, of vitriol, juice of Lemons, also spirit of Harts-horn, also dung of Sheep, and Geese, *crocus Martis* and diverse other preparations thereof, are frequently used with success in the Jaundies.

The third indication vital suggests more and sundry intentions of cure, procuring the strength to be restored, and the removing the symptomes whereby it is prejudiced, all or the chief particularly to enumerate, and prescribe would be a vast and tedious work; wherefore we will annex only certain general rules about diet, and some cordials and anodynes appropriate in this condition.

The curatory indications being appointed after this manner, it next lies upon us to accomodate the most select medicines, *viz.* as well the simple as the compound, to these now proposed intentions of curing, and to unfold the manner and reason of the operating of remedies which are accounted of special note in this disease. Therefore first we propound the forms of evacuating medicines appropriate in the Jaundies.

1. Vomits.

Vomiting medicines are frequently wont to help in the recent Jaundies, while the tone and strength of the bowels are firm; in as much as they alleviate the stomach always oppressed in this disease with an unprofitable burden of viscous phlegm; and moreover do free their infarctions by irritating the *vasa choledocha*, and by much shaking all the passages of the Liver, and make easie the passage of the choler by the former accustomed ways.

Take of the infusion of Crocus Metallorum half an ounce to six drams, Wine of Squills an ounce, Oxymel simple half an ounce, make a vomit to be taken with government.

Sometimes it is convenient to exhibit, the evening before, the following preparatory medicine for the easier vomiting.

Take of the powder of Asarum roots, fecula Aronis of each a scruple, of Tartar vitriolated half a scruple, of Oxymel of Squills an ounce, mix them.

Take of Sulphur of Antimony seven grains, Scammony sulphurated eight grains, cream of Tartar half a scruple, make a powder, give it in a spoonful of panada.

Take nine Asarabacca leaves, cut and bruised put them into three ounces of white wine, press out the liquor, let it be taken in the morning with regiment.

O

Take

Take of Gambugia prepared eight grains, Tartar vitriolated seven grains, make a powder.

2. Catharticks.

Purgers.

Purgers take place in this disease, be it recent or inveterate, viz. that as well a more plentiful store of Excrements may be now and then withdrawn from the first passages, as that the *vasa choledocha* may be excited to Excretions.

A Bolus.

Take of Electuary of juice of Roses three drams, Rhubarb a dram, Salt of Wormwood, Cream of Tartar, of each half a Scruple, Syrup of Rhubarb, make a Bolus.

Apozems.

Take of the roots of sharp-pointed Dock prepared one ounce, the tops of Roman Wormwood, of Centaury the less, of each P. ij. Gentian and Turmeric roots an. two drams, yellow Saunders one dram, boyl them in a pinte and a half of Spring-water to a pinte, adding towards the end Senna six drams, the best Rhubarb three drams, Agarick a dram and half, Coriander-seeds two drams, White-wine two ounces, let them boyl close two hours, after strain it and clarify it by settling; the Dose from four ounces to six, with one ounce of Syrup of Rhubarb, the water of Earth-worms three drams; make a potion to be repeated every or every other day, for three or four dayes.

In a weaker Constitution.

A Potion.

Take choice Rhubarb two drams, Agarick trochiscated, half a dram, Cinnamon half a scruple, Ginger half a scruple, make an infusion in White-wine and Cichory-water, of each three ounces, for three hours, in it strained dissolve one ounce of Syrup of Rhubarb, water of Earthworms two drams. Or Rhubarb from half a dram to a whole one, Salt of Wormwood a scruple, make a powder.

Pills.

Take pil. Ruffi a scruple, Extr. Rudi half a scruple, make 4 Pills, take them in a morning with government, after 4 or 5 dayes repeat them.

Deopillative Medicines.

In the third place follow Deopillatives, which are also Diureticks, or Diaphoreticks, some whereof are accounted specifick, by reason of similitude of substance; Medicines of this sort, both promote the separation of choler from the blood, and urge the passage of it, being separated, through the passages and pores in the Liver open but little. Moreover, in the mean time, by dissolving the blood, they carry off the serosities and cholerick recrements thereof, sometimes by sweats and urine.

Elixir.

Take of Elixir Proprietatis one ounce, take 20 drops in the morning, and at Five in the afternoon, with a convenient vehicle: after the same manner are taken, Tincture of Antimony, or of Salt of Tartar, and the simple mixture in a greater Dose: for vehicles, Apozemes, distilled Waters, and Juleps for this Intention of curing are convenient.

Apozems.

Take of the roots of Celandine the greater, stinging Nettles, Madder, of each one ounce, tops of Roman Wormwood, white Horehound, Agrimony, Germander, of each one handfull, Worm-seeds two drams, Shavings of Ivory and Harts-horn, of each two drams, yellow Sanders a dram and a half, Coriander-seeds two drams, boyl them in three pound of Spring-water to two pound, adding of White-wine four ounces, strain it, and adde Syrup of Cichory with Rhubarb two ounces, water of Earth-worms, an ounce and a half, make an Apozeme, the Dose four or six ounces twice in a day.

Take of white Horehound dried, Centaury, of each one handfull, Gentian and Turmeric-roots, of each three drams, Cinamon one dram, Saffron half a dram, being sliced put them into a Glas with two pound of White-wine or Rhenish-wine; make an infusion, the dose three ounces.

To this we will adde Gesners famous Antictericum.

Take of the roots of stinging Nettles a pound, Saffron one scruple, bruise them well, and draw off the tincture with White-wine, the dose three ounces 4 or 5 dayes.

Empirick Remedies.

Like to the former is that of Fr. Joel. Take the Roots of Celandine the greater, two handfulls, Juniper-berries a handfull, bruise them and pour on them a pound of Rhenish-wine, and draw out the juice, the dose four ounces twice a day.

The juice of white Horehound is mightily commended by Dioscorides, and the Syrup of the same by Forestus, for curing the yellow Jaundice.

In

In lieu of an Elixir, and other chymical liquors, which to avoid nauſeouſneſs are to be taken in very ſmall quantity; to others endued with a ſtronger Conſtitution, Eleſtuaries, Powder and Pills may be adminiſtered with better ſucceſs.

Take of Conſerve of Roman Wormwood, of the yellow Rinds of Oranges and Limons, of *An Eleſtuary.* each two ounces, Species Diacurcuma one dram and half, powder of Ivory, yellow Sanders, of Lignum-Aloes, of each half a dram, Troches of Capers one dram, of Rhubarb half a dram, Salt of Wormwood two drams, with Syrup of Cichory with Rhubarb, make an Eleſtuary, the doſe the quantity of a Cheſnut twice a day, drinking after it three ounces of the following Julep.

Take of the greater Celandine-water, Fumitory, Wormwood, Elder-flowers of each five Diſtilled Waters, Snail-water, water of Earth worms, compound, of each two ounces, Sugar half an ounce, mingle them and make a Julep. Or,

Take of the roots of ſtinging Nettles, Angelica, Gentian, of each four ounces, the greater Celandine leaves and roots, ſix handfuls, Wormwood, Tanſie, Southern-wood of each four handfuls, the outer rinds of twelve Oranges and four Limons, prepared Worms and Snails of each one pound, Cloves bruised two ounces, being all cut and bruised pour upon them eight pound of White-wine, let them be diſtill'd in a cold ſtill, and the whole water mixt. Or,

Take of filings of Steel one pound, freſh Strawberries ſix pound, put them into a glazed pot, ſtirring them together, and let them ſtand a day, afterwards adde of Engliſh Rhubarb ſliced one pound, the rinds of four Oranges ſliced, pour upon them of White wine ſix pound, and diſtill them according to Art; let all the liquor be mixt together. The doſe of this and of the former is three ounces twice in a day after the Eleſtuary or any other medicine.

Take of Turmeric-roots, Rhubarb, of each one dram and a half, the Bark of Caper-roots, of Aſarum-roots, of each half a dram, Extract of Gentian, and Centaury, of each one dram and a half, Salt of Wormwood four ſcruples, Water-creeſe ſeeds half a dram, of Rocket half a ſcruple, Elixir Proprietatis one dram, gum Ammoniacum diſſolved in the water of Earth-worms what will ſuffice to make a maſs, form it into ſmall Pills, the doſe is half a dram evening and morning, drinking after it three ounces of the diſtilled water.

Sylvius doth much magnifie for cure of the Jaundies, the Decoction of Hemp-ſeed in milk, and the ſolution of Sope, and from thence endeavours to eſtabliſh his own Hypotheſis (as we have above intimated) whereby he endeavours to deduce the Ætiologie of the Jaundies, rather from an alienation of the choler, than from the obſtruction of its paſſages. *Sylvius his Empirical Remedies.*

2. The Second Indication reſpecting the altering or tempering of the blood, by which it may breed but moderately, and duly ſeparate the choler, requires Medicines of that ſort, which depreſs the Sulphur and fixt ſalt too much advanced. For theſe ends, I know not by what chance or conduct Medicines endowed with a volatile ſalt, as Worms, Snails, Millepedes, yea Lice, Dung of fourfooted Beaſts, and Fowl, are brought into practice for curing the Jaundies, and not only preſcribed by Empiricks, but the more famous Phyſicians: Theſe ſometimes by themſelves, but oftener joyn'd with Purgers and Deopilatives, become the chief Ingredients in Compoſitions againſt the Jaundies. *The ſecond Indication. Remedies againſt the Jaundies endowed with an animal volatile Salt.*

Fonſeca preſcribes Goſe-dung gathered in the Spring-time and dried, as alſo the white excrement of Pullets, of both which let the Powder be given in a convenient vehicle from half a dram to a whole one.

Take powder of Earth-worms prepared, of Goſe-dung, of each three drams, Ivory, yellow Sanders, of each half a dram, Saffron one ſcruple, make a powder, divide it into ſix parts. One to be taken every morning with ſome appropriate liquor. To the Apozeme, or Antiſeptic Tincture preſcribed above, Earth-worms, Goſe-dung, and alſo Sheeps-dung are profitably added. *Various forms of them.*

Take Millepedes freſh and alive from 50 to 100. Saffron half a ſcruple, Nutmeg a ſcruple, bruise them together, and infuſe them in Water of Celandine four ounces, of Earth worms two ounces, expreſs them ſtrongly, and drink it: after this manner take it firſt once, then twice in a day for a week.

The vulgar and Empirical remedy with us is, that Nine quick Lice be taken in a morning for five or six dayes, by which remedy they report to me many to be cured (whenas other remedies effected little) which truly can help by no other means than by restoring the volatile Salt depressed in the blood.

Also such as are endued with a mineral volatile Salt.

Upon the same account of succour even in this disease the flowers of Sal Armoniac, the volatile Salts of Amber, Harts-horn, Soot, in like manner their Spirits are frequently administred with great success.

Take powder of Earth-worms prepared two drams, Species Diacurcuma one dram, flower of Sal Armoniac half a dram, Salt of Amber a scruple, Extract of Gentian one dram, Saffron one scruple, Gum Ammoniacum dissolved in water of Earth-worms what suffices, make a mass, and form it into small Pills; the Dose is three or four, morning and evening, drinking after it three ounces of the Julep before prescribed.

Take Spirit of Harts-horn tintured with Saffron three drams; Dose from 15 drops to 20. with the distilled water prescribed above.

Steel remedies of several kinds.

In this Class of Medicines by which the icterical distempers of the blood are to be corrected, steel'd remedies do also challenge their place by right; for these afford notable help, not so much by unlocking the obstructions of the bowels, as by depressing the rage of the Sulphur, and fixt Salt, and by volatilizing the blood, in the jaundies, no less than in other cachectical distempers.

Wherefore, to the Decoction, or Tincture, or Infusion above prescribed, is properly added the filings of Iron, or the prepared powder thereof (its mineral consistence being some wayes opened) or the vitriolic Salt extracted; from hence it is, that Medicinal waters heal even to a miracle those sick of the Jaundies, that had been despaired of; although these drunk in a very large quantity, inasmuch as they pass through all the vessels, do also open the passages of the Liver, however shut up.

Therefore also even Preparations of Steel are added to the Electuary, Pills and Powders above recited, one while this, another while that, in due proportion. Moreover the Syrup thereof given twice a day to one spoonfull, in three ounces of Apozeme or water against the Jaundies; also tincture of Steel to twelve or fifteen drops may be administred in the same manner.

Outward and Sympathetick remedies against the Jaundies.

In the last place we may annex to this classis of altering Medicines those things which not taken inwardly, but outwardly applyed, and by contact, used to the very urine of the Patient are held to cure this disease.

As to the former, a remedy often tryed by the vulgar, is a living Tench-fish, whose Scales and outer superficies do resemble a yellow colour, applyed to the right Hypochondria, or Stomach according to some, (to the soles of the feet, according to others) whence a sudden flight of this disease is expected; hence although many promise themselves a sure cure, it hath often deceived me.

Another cure of the Jaundies at a distance is said to be done by I know not what sympathy or secret manner of working.

Take the fresh Urine of the Patient made at one time, of the ashes of the Ash-tree searced, as much as suffices to reduce it into Paste, which may be formed into three equal balls, to be placed in a place shut, near the hearth or Stove; as these dry and harden, the Jaundies will vanish; after this course, I have known this inveterate disease happily cured, although resisting many other remedies; the practice thereof is very familiar with the Vulgar.

The reasons of some of them.

If of a certain it could be made manifest that this effect doth for the most part happen, and the reason of it be inquired into; in the first place we ought to suppose a consent or sympathy of the spirits and other particles in the animated blood, with other symbols inmates of the fresh urine; and that they immediately are affected in the like manner with these. Notwithstanding it is evident enough that a lixivial Salt mingled with urine, doth presently set free the volatile salt formerly subdued or enwrapt in other particles; as is plainly seen in distillation of Urine, which if you urge by it self with a sand-heat, nothing but phlegm will arise; but adde the calx of Tartar, or Ashes, immediately the Spirit and volatile Salt will come forth: wherefore, that Empirical administration being administred, at the same time, both in the Icteric urine, and also in the blood of the Patient, the volatile Salt escapes out of the power of the fixt Salt and the Sulphur, and for that cause the icterical

rical distemper of the Blood is put to flight. Also upon the same reason is built another sympathetical cure of the Jaundies, whereof *Phil. Grulingius* and *Felix Platerus* do make mention, viz. the sick party pissing upon Horse-dung while it is hot, hath cured many of the Jaundies; inasmuch as the fixt Salt of the Urine, and thereby the fixt Salt of the icterical blood of the patient, is altered by the volatile Salt of the fresh dung, and reduced into its due temperature.

3. The third Curatory indication vital institutes a convenient course of Diet, and moreover Cordials and Anodynes, of both which there is frequent need.

The Third Indication vital.

As to what relates to the former, Food in this disease, more than in any other ought to be medicinal. For Vegetables and their parts, styled commonly Hepatick remedies, are boyled in the broths of these Patients. And these also are wont to be made instead of other flesh, of Worms, or Snails, (which are accounted Antidotes against the Jaundies.) Moreover Ale, and other ordinary drinks are impregnated with infusion of Medicaments.

Take of the roots of stinging Nettles, of Strawberries, of each an ounce and half, Eringo-roots candied one ounce, Ivory and Harts horn, of each two drams, Earthworms cleansed twenty, a Crust of White-bread, Mace two drams, boyled in two pound of water to one pound, strain it through Hippocrates sleeve, to which adde Diasantalon half a dram, make broath, whereof take from four ounces to six, twice in a day: for ordinary drink, fill a Tub of four Gallons with Beer, after it hath wrought, put in the following Bag.

Take the tops of Roman Wormwood, white Horehound dried, of each two handfuls, the roots of sharp pointed Docks six ounces, of the Bark of Ash, of Barberries, of each 3 ounces, the outer Rinds of eight Oranges, and of four Limons, being sliced and bruised, let them be prepared according to Art.

Since many sick of the Jaundies are usually affected with a great languishing, and frequent faintings of the Spirits, they have also need of cordial Remedies.

Forms of Cordials.

Take of small Aqua Mirabilis eight ounces, water of Earth-worms four ounces, Syrup of Orange-peels two ounces, mingle them, the dose two or three ounces.

Moreover, they who are troubled with this disease, do very much suffer with pain sometimes very troublesome in the night, and are often obnoxious to waking; wherefore also Anodynes come into use for administration.

Take of Aqua Mirabilis, water of Earth-worms, of each one ounce, Diacodium six drams, Tincture of Saffron half an ounce, the dose one or two spoonfuls late at night, if sleep be wanting.

Take of Laudanum tartarizated two drams, Aqua Mirabilis two ounces, Syrup of Clove-gilly-flowers one ounce, mix them, the dose is one spoonfull after the same manner.

SECT. II. CHAP. II.

Of other Hepatick Remedies.

THe Liver is seldom or never found obnoxious to an Atrophie or extenuation, since truly it performs the office of a strainer, and according to some, of a mingling bowel; but on the contrary by reason of many causes and occasions, it runs the hazard of being encreased as to its bulk, and to be stuff'd and swell'd with divers things gathered therein, and with concretions. Hence no small account of health consists in this, that the Liver having right conformation may freely convey the blood every where, without keeping back too much Custom or provision for it self.

The Kinds of Remedies assigned to the Liver.

Truly many faults, and indeed not altogether undeservedly, are imputed to this Bowel, as also unto the Spleen; the chief Kinds of which we shall touch upon. The Liver frequently and chiefly is wont to be faulty in one of these two, *viz.* First that intercepting the nutritious juice appointed for other parts, it bestows it to its own proper use; this is plainly discerned in Children affected with the Rickets, and moreover in many others that lead a sloathful and idle life. Anciently there was an art with the *Romans* so to feed a Goose that the Liver prodigiously encreased might weigh more than the whole body. Secondly, the other fault of the Liver is, that it too easily receives all the excrements and feculencies whatsoever of the depraved Blood, brought into its inward recess, and by retaining them there, doth not only grow large, but is obstructed in its passages, whence frequently comes the Jaundies, or a Droplic; it contracts also tumours and preternatural Concretions of divers kinds of matter.

Two general indications of curing this bowel.

Many and divers distempers of the Liver ought to be referred to these two heads: of each of which it is not our purpose to institute particular pathologies. As to what appertains to the general pharmacie of this bowel, there will be one principal scope of curing, that its income be diminished as much as may be, or altogether cut off. Wherefore it will behove us to procure these two things, *viz.* That the Liver augment not above measure, by taking the nutritious juice too much unto it self; and that it retain not the feculencies of the Blood, whereby it may be affected with obstructions and preternatural Tumours.

It will be much easier to prevent than cure either of these faults of this bowel. For truly the former may be done, respect being had only that the blood be well constituted in its Temperament, and enjoying a free Circulation, it may both dispense its nutritious juice to the parts, and especially its outward parts, and driving forth all its excrements to the particular Emissaries, it may put them away there. And surely, the Medicines vulgarly called Hepaticks, do first and more immediately exert their power by purging the blood, rather than by correcting of the Liver: those namely consist of particles of such a kind, which entering into the blood, and not mixing with it, do so stirre up the mass thereof, and break it into pieces, that all the Coagulations and Concretions being taken away, all its dregs and impurities may easily depart, and being carryed to their proper Emunctories may be cast out of doors.

Medicines vulgarly called Splanchnick, first and chiefly operate upon the blood.

For truly all remedies which are called Splanchnick, first work upon the blood, and incite its constitutive parts into a kind of effervescency, and so tofs, divide, and move them rapidly to and fro, that the vaporous effluvia being sent into the habit of the body, the serous excrements into the Kidneys, the cholerick into the Liver, the melancholy into the Spleen, and others to other Emissaries for which they are fitted, may be shut out, without impediment or adhesion.

What such they are which more especially respect the Liver.

Wherefore the same Remedies which help the Liver, help also the Spleen, the Reins, the Lungs, and other the Bowels in their separations; and for the most part move sweating and urine. If any be found to respect one part before the rest by any specifick power, it is therefore because their particles being more ally'd unto the excrements to be separated within that bowel, and from thence associated to them are conveyed thither together with them. For this reason Rhubarb, Turmeric, the greater Celandine, with many others adjoynd to the bilious humour, do the more easily reach the passages of the Gall, and are wont to succour in the Jaundies. We have observed before

before, the energies and manners of operating of Medicines of this kind. As to what appertains to the other, vulgarly called Hepaticks, first we will annex briefly certain forms of those which are reported either to prevent or remove the unnatural augmentation of the Liver, and then those which are held to provide against or take away the obstruction and preternatural Tumours thereof.

1. Against the too much encrease, or impropportionate nutriment of the Liver, first a more sparing and thin diet, short sleeps, and moderate and frequent exercises are convenient: wherefore we prescribe for Infants, and Children, when they are discovered obnoxious to this distemper, as in the Rickets, that they suck thin and ferous milk, that they be shaken or tossed in their Nurses arms, and tumbled quickly to and fro, or be carried swiftly in a Chair or Coach, and as soon as may be, learned to go and to use their feet.

Take of the water of Snails, of Earth worms, of each three ounces, Syrup of Chicory Some forms of with Rhubarb two ounces, spirit of Sal Armoniac with Gum Ammoniacum one scruple, mix Hepaticks. and take a spoonfull evening and first in the morning.

Take of the roots of Maleferne, Chervil, candied Eringoes, of each one ounce, the leaves of Agrimony, Harts-tongue, male Speed-wel, of each one handful, Shavings of Ivory, Harts-horn, of each two drams, white and yellow Sanders, of each one dram, Raisins stoned one ounce and a half, Barly three drams, boyl them in three pounds of Spring-water to two, to it strained adde of Snail and Earth-worm water, of each one ounce and half, Syrup of Chicory two ounces, make an Apozeme, take two or three ounces in a day.

Take Powder of white and yellow Sanders, Crabs-eyes, Lignum-Aloes, of each half a dram, Salt of Wormwood one scruple, make a powder, the dose half a scruple to a whole one twice a day.

Take Empl. Diasaponis, Cerate of Sanders, of each what will suffice, make a Plaister to be applied to the Hypochondrion.

Take Unguentum Splanchnicum two ounces, Oyl of Wormwood one ounce, mixe them, and make a Liniment for the region of the Liver.

Hither many other methodical as well as Empirical Medicines being used for the Rickets may be referred, but we hasten to other things.

2. Remedies ordained for most other distempers of the Liver are either simple or compound. Very many of the former sort are reckoned by Authors, as if they were procreated for this particular use. *Heurnius* says, *That God Almighty hath offered to the World the greater plenty of Remedies of this kind, by reason of their notable necessity.* And to this Rank may be referred in the first place all kinds of Chichories, the Sorrels, the sharp pointed Docks, and almost all Vegetables endowed with bitterness and something of sharpness, (wherein the deoppilative vertue is reported to consist) as Wormwood, Germander, Ground-pine, Fumitory, Tanzy, Agrimony, Liverwort, Lignum Aloes, all the Sanders, Tamarisk-bark, and Ash-bark, the roots of Capers, with many others, which commonly make up the greatest part of Herbals; so that whilst the Liver like a certain Goddess ruled sanguification, very many Medicines were used to be ascribed for its safeguard and succour.

The fixt Salts of herbs, the acid Spirits of Minerals drawn by distillation, belong by right to this number, as they do chiefly exagitate the masse of blood, dissolve the Concretions thereof, dispatch their obstructions, and cause it every where to be passable, as to all the parts thereof.

If I here omit Chalybeates, most Chymists will censure me very unjust to the Liver; for truly as the Prerogative of *Venus* is vulgarly attributed to this bowel, so as to constrain to Love, we may hence expect that *Mars* will be perpetually kinde unto it. And really it is manifest by Reason, as well as Experience, that Preparations of Steel are convenient in hepaticall affects, as chiefly in the Jaundies, and oftner in the Drop-sie; wherefore these are put into the Receipts of the Ancients and modern, and among curatory Compositions. For what reason the Preparations of Steel as in like manner the medicinal waters from Iron, as well natural as artificial, do purifie the masse of blood, and by consequence do relieve many distempers commonly call'd Hepaticall, is shewn by us largely enough in another place, so that here is no need for repetition.

Medicines that are appointed by Physicians for the Liver are divided into various

ous forms, but first into hot and cold, and also into moist and dry; accordingly as the temper of this bowell is supposed to consist after divers manners: when in truth it is only a dyscrasie of the blood, which being so diversly faulty, desires so various an energy of medicines. Neither is it a less vulgar error, that in the estimating of mens constitutions, the various temperament of every one due to the blood, is ascribed chiefly to the Liver, as hot or cold, or otherwise disposed.

The Shop-com-
positions of He-
paticks.

In the Antidotaries of the Ancients there are many Shop-compositions extant, which seem to be designed for the Livers sake only, of which sort are *Rhasis* his Electuarie of the drofs of Iron, *Crocus ferri* of *Balchusis*, which being mixt with Treacle is commend- ed for hepaticall affects; the species *Diatrion santalon*, *Diarrhodon Abbatis*, *Trochisc* of *Rhubarb*, of *Agrimony*, of *Capers*, *Diaturcuma*, *Dialacca*, Syrup of *Wormwood*, *Coico- rie*, of the five roots, *Byzantinum*, with many others, unto all whose forms, a valt Catalogue is annext for curing all the diseases of the Liver. But these passed over, it pleases me now to propound some Kinds and Examples of Medicines which are count- ed deopillative according to the practice of the Moderns.

Therefore for an opening Decoction,

Magistral
Compositions.

Take of the roots of *Ferne*, *Chervil*, *stinging Nettles*, *Dandelyon*, of each one ounce, the leaves of *Agrimony*, *Harts-tongue*, *Speed-well*, *Oak* of *Jerusalem*, *Liver-wort*, of each a handfull, white and yellow *Sanders*, of each three drams, *Ivory* half an ounce, red *Cicers* an ounce, *Coriander-seeds* three drams, *Raisins* two ounces, boyl them in four pound of water to two pound, adding towards the end *White-wine* four ounces, strain it through *Hippocrates Sleeve*, to which adde Species *Diarrhodon Abbatis* one dram, of our prepared *Steel* two drams, Syrup of *Chicory* with *Rhubarb* two ounces, the *Water* of *Snails* and *Earth-worms*, of each one ounce, the dose six ounces twice in a day after a dose of the following Electuary.

Electuary.

Take of *Conserve* of the yellow of *Oranges* and *Limons*, of each two ounces, of *Worm- wood* and *Fumitory*, of each one ounce, simple Powder of *Aron-roots*, yellow *Sanders*, *Lignum Aloes*, of *Caper-roots* of each one dram and a half, *Crabs-eyes* one dram, Salt of *Wormwood* two drams, Syrup of *Fumitory* what suffices, make an Electuary, the dose the quantity of a *Walnut* twice in a day, drink after it a draught of the *Apozeme* now prescribed, or of the following distilled water.

A distilled Wa-
ter.

Take the leaves of *Wormwood*, *Centaury*, *Tansie*, both sorts of *Southern-wood*, *Tama- risks*, of each four handfulls, of green *Walnuts* four pound, of *Ashen keyes* green two pound, the Rinds of ten *Oranges* and four *Limons*, *Snails* and *Earth-worms* prepared, of each one pound, all being sliced, pour on them of *White-wine* eight pound, distill it in a cold Still, let all the liquor be mixt together, the dose three ounces, sweetning it with *Sugar* or a fit Syrup.

If a form of Pills will please better, the ensuing Extract called in the Shops *Ex- tractum Ephraeticum*, seems profitable.

Pills.

Take of white and clear *Tartar*, and of fresh Filings of *Iron*, of each 4 ounces, let them be ground together into powder, after boyl them in *Fountain-water* from four pound to two (some use *White-wine*) to the strained liquor adde the tops of *Centaury*, of *Roman Wormwood*, of *Carduus*, of each one handfull, *Gentian-root* half an ounce, Species *Diaturcuma* an ounce and half, let them boyl shut close for three or four hours, strain it, and evaporate by the heat of a Bath to the consistence of Pills, adding roots of *Rhubarb* or Species of *Hiera Picra* two drams; the dose is from one scruple to half a dram made into Pills, in the evening, with an appropriate vehicle.

For the same intention, viz. to prevent or to remove the obstructions of the Liver, a medicated purging Ale, to be taken many dayes in Spring and Autumn, is by some very much magnified, and exactly observed every year during their lives.

Take of the roots of sharp pointed *Docks* prepared, *Polypodie* of the *Oak*, of each 3 ounces, *Aladder-roots* two ounces, *English Rhubarb* two ounces, of leaves of *Senna* four ounces, *Epithymum* two ounces, yellow *Sanders* one ounce, *Carthamus* and *Coriander-seeds*, of each one ounce and a half, slice them and bruise them according to Art, make a bag for 4 gallons of Ale, after six dayes let him take to 12 ounces more or less in the morning, expect- ing four or five Stools without regiment.

SECT.

SECT. II. CHAP. III.

Of Remedies for the Dropsie called Ascites.

After the Jaundies are the Remedies thereof, our method leads us to treat of a Dropsie; not because of the Vulgar opinion, that it always arises from the fault of the same bowel; but because that former disease having long continued, for the most part concludes in this: which happens so, not so much from the fault of the Liver, as from the whole Blood, for this and not that perform sanguification. Wherefore, when the mass hereof hath for a long time been filled with cholerick excrements, and at length degenerating from its temper, accumulates also watery humours, then doth a Dropsical Disposition come upon the Jaundies.

But whereas three sorts of Dropsies are vulgarly supposed, viz. *Ascites*, *Tympanites*, and *Anasarca*, we will at present handle only the two former, appertaining to the Splanchnick or Pathologie of the nether Belly. And first what relates to an Ascites, this disease as to its matter and formal reason is manifestly known by the sign of even many senses together, viz. it is a Tumour of the Abdomen, from a waterish tumour contained within the cavity thereof. The water making this tumour, sometimes encreases to a huge inundation, and scarce credible quantity. I have once seen a Tub would hold 15 gallons filled with water taken out of the Abdomen of a woman dead of a Dropsie. But whence that humour proceeds, also by what manner, and from what causes it gathers together in the belly first, and afterwards is sensibly augmented; and lastly by what passages, and by what vertue and operations of Hydragogue Remedies, it may again be taken from thence, and evacuated, seems most difficult to be unfolded.

The more remote causes of an Ascites.

First in respect of blood.

As to the former, viz. the encrease of water, some have thought it to descend from the Liver, and others from the Spleen distempered, into the cavity of the Abdomen; and so this bowel or that being vitiated, always to be the cause of an Ascites. But that this is otherwise, Anatomies of many dead of this disease, do manifestly declare: when after the inundation of the belly, the Liver and Spleen are found often without fault. And truly these bowels do not seem the Springs of any such illuvies, being endowed with no cavities, wherein waters might be accumulated together: wherefore the origine of an Ascites, as of a standing Pool or Lake, is to be derived from a River, or at least a glut or inundation of some Humour.

It doth not always proceed from the Liver & Spleen.

The humours that flow within the passages, or Vessels as Brooks, are chiefly these three, viz. the Blood, the milkie Humour, and the Lympha. The showering or distilling of water may come to pass from the nervous Liquor which sometimes slowly and insensibly sweats out of the fibres and membranes, and from vapours condensed within the hollownes, or some Cavity of the Body. Whether by these wayes an Ascites doth rather, and oftener proceed, we will now search.

The humours by which it is produced are,

And in the first place as to what relates to the blood, it is without doubt, the Serum falling from the mass thereof, too much dissolved, as it doth excite Fluxions and Catarrhs of various kinds, so it sometimes stirs up the greater illuvies of waters, viz. Dropsical: wherefore when an Anasarca proceeds altogether from this cause, and when oftentimes an Ascites comes upon that disease not immediately healed, we may well enough infer that either distemper is induced from a watery humour, every where poured out from the little mouths of the Arteries. Moreover, it is not much improbable, that the Serum of the dissolved Blood is first and solitarily poured out of some end of the Cœliac and Mesenteric Arterie being open into the Cavity of the Abdomen, and so brings on an Ascites without an Anasarca going before; and so especially if perhaps it happen, that scirrhus Tumours, Ganglion's, little swellings, or preternatural Concretions of another manner, are first raised about the Mesentery, the Spleen, the Liver, the Womb, or any of the other bowels of the nether belly: for, because the Circulation of the blood is hindered in those places, that the blood being carryed through the arteries, may be some way brought back, the serous part being thrust out from its company, falls into the cavity. For truly it is most evidently manifested, that it so comes to pass, by this Experiment mentioned by us in another place, viz. If in a living animal, the jugular veins being taken up and bound

First the Blood.

with a thred, the reduction of the blood be stopt, the whole Region of the head swells in a short space, with a water between the skin, and clearly hydropical. And truly I have more frequently observed that an Ascites hath followed upon secret tumours gathered and raised in some place in the lower belly : which certainly happens for the reason above recited. When the course of blood being obstructed, the watery part is extravasated in a short space, that humour is not meerly serous, but besides, the nutritious Liquor, ordained to nourish all the solid parts, is emptied into the belly : wherefore, while this Region swells up, the members are extenuated, and the Lympha taken out from an Ascites, with heat thickens and grows white, like the white of an Egge.

2, & 3. The
milkie and wa-
tery humour.

It is also very probable, that the milkie Vessels being burst asunder, pour out their humour into the cavity of the abdomen. Truly the most renowned *Sylvius* thought this disease most frequently engendred from such a cause. And truly as out of the milkie or watery Vessels, viz. one of them or both together, being divided, or opened, we may well suspect the illuvies of water or chyle sometimes to overflow the bowels of the nether belly ; so the following observation seems to confirm the same thing. Of late one that had been long sick of the Jaundies, and in the mean time temperate and abstemious of drink (to which he was not prompted by thirst) contracted an Ascites, increased in a short time hugely. After that medicines were administered in vain, a Paracentesis is attempted according to the manner of *Sylvius*, with a hollow Needle ; out of the orifice, not ictical water, but limpid and thin flowed out abundantly ; from whence we may inferre, that hydropic humour flowed not out of the mass of blood, for then it had been coloured, but distill'd out of the lymphic or milkie vessels into the cavity of the abdomen. We have joyn'd together as akin the ways of the milkie and lymphic Vessels in propagating an Ascites, because both vessels do convey the chyle, or what is analogous to it, to the common Receptacle ; and many branches or leading Pipes of either kind, are distributed about the bowels of the nether belly ; in the mean time, it is not improbable but that a solitary fault of either vessel may sometimes produce an Ascites.

As to the other ways of generating an Ascites, proposed in the beginning, I am scarce induced to think, such an inundation of the belly can easily arise from the distilling of a nervous humour, or by reason of vapours there condensed : although perhaps in a Tympany where the cavity of the abdomen is enlarged, and transpiration hindered, the effluvia that were wont to exhale, being forced inwards, are changed into Lympha or water, wherefore for the most part an Ascites is ever 'conjoyn'd with that disease.

An Ascites often
the product of
the Jaundies.

The immediate or conjunct causes of an Ascites being design'd after this manner, which indeed seem to be, either a watery humour poured out of the Vessels bringing Blood, or Lympha or Chyle poured out of the proper passages of them both ; now we must in the next place inquire about the more remote causes of this disease, viz. for what occasions, and after what manner, the vessels affected of either sort deposite their burdens into the cavity of the belly.

The kinds of a
Dropse.

First therefore, that the watery part of the blood sweats out into the *Aqualiculum* or belly, either the very Blood, or Vessels containing it, or both together, are in fault. The Blood is in fault, when being depraved in its Crasis it doth not rightly contain within its consistence the constitutive parts, but being apt to be dissolved, it every where rejects its serosities from the mixture ; which either it drives out by Urine or Sweat, or permitting them to reside within, pours them out into the pores of the flesh, or the cavity of the bowels. The vessels bringing blood grow faulty for a second reason, for that their extremities or little mouths either are too much loose, or altogether shut up. In the former state the clew of Circulation of blood is not entirely and firmly continued ; but the thinner and more crude part of the blood being apt to depart, is suffered to flow out near to the interspaces or inosculation of the Arteries and Veins ; likewise on the other side, when the course of blood is hindered, by reason of a tumour or obstruction of some vessels, their little mouths being thoroughly closed ; to this being so straitned that a passage may be made open by some means, that which is thin and watery is extravasated, and sent away into the neighbouring places, as we have shewed above.

The Description
of an Ascites.

2. In respect of
the Lympha-
dms.

2, & 3. But an Ascites beginning alone, doth often arise, by reason of the milkie or lymphatic vessels being depraved ; wherefore seeing we suppose the cause of this kind of disease to be oftentimes conjunct, we must enquire, by what means, and for what occasions, these vessels are wont to be so opened or burst asunder, that they pour out their liquor into the cavity of the belly.

First

First therefore as to what belongs to the Lymphaducts, these vessels may be in fault after a diverse manner, but chiefly, either that being obstructed or compressed near their origine, they do not receive the humour, or being burst about the middle or extream parts, do pour it out into the belly. There are many causes and reasons of effecting of either of these, for it may be a viscous matter obstructs their beginnings, or glandulous, scirrhus, and other preternatural Tumours compress them, as also a vast inundation of Lympha flowing out, moreover vehement motions of the Body, or passions of the mind, may burst them asunder.

2. The milkie Vessels, no less than Lymphatick, are in danger to be broke, and so by pouring out their liquor into the cavity of the Belly, do excite the Dropsie called Ascites; and truly they are wont to be hurt for the like reason, in regard their middle passages, or their ends, either are obstructed by a more viscous chyle brought into them, or by Phlegme from the intestines, or they are compressed by Tumours bred in the Mesenterie: for forthwith the chyle entering into the beginnings of the vessels, and not finding a passage, first very much distends them, and afterwards breaks them. There are many causes and occasions, for which the thicker and obstructing humours are driven forwards into the milkie Vessels; for besides an irregular Diet, and for the most part from meats hard to be digested, this evil is frequently caused by too much drink, or immoderate exercise immediately after Food, also from cold drink while the Bowels are very hot; for so the passages of the Vessels before gaping are suddenly shut, and afterwards more narrowly closed, wherefore the chyle sticking within their straitned chanel, doth thoroughly fill and obstruct them in a short space.

3. In respect of the milkie vessels.

As to what belongs to the differences of this Disease, besides them already cited, viz. that it comes after an Anasarca, or comes solitary; that this also is manifold and after a diverse manner, according as the Vessels bringing blood, or water, or milk, are found in the fault; Moreover we observe, that the Dropsie called Ascites sometimes proceeds from a meer watery humour filling and distending the parts of the nether belly; but sometimes there happens to this deluge an extension of the membranes, or inflations made by the irregularities of the inmate spirits, and so they do encrease the swelling of the Abdomen; and in this case a certain Tympanites comes upon an Ascites, even as more frequently on the contrary, this is the offspring of that.

The differences of this disease.

Moreover, in an Ascites meerly watery, sometimes the Lympha only fluctuates within the Cavity of the Abdomen, so that in the mean time the bowels being soakt in it, continue still entire, and little or nothing encreased in their bulk; but sometimes besides the inundation of the Lympha in the hollow of the belly, the blood being slowly circulated there, and almost stagnating it is much diluted with water; Moreover the Parenchyma of the bowels, and the sides of the Vessels and of the membranes, and chiefly the Glandules every where numerous, being moisten'd, do swell with the flowing water, and so the tumour of the belly consisting as it were of many pools of water and moorish Contents, rises into a vast bulk.

The Prognostick of this Disease, is always suspected and accounted of an ill omen: for none of the vulgar but will pronounce the obstinate tumour of the belly to be very dangerous and difficult to cure: If any seem to be affected with a Dropsie, or a Consumption, with them presently the next question is, Who shall be his heir.

The Prognostick.

An Ascites beginning after an Anasarca (which proceeds commonly from the whole mass of blood being pour'd forth into serosities, and sweating them out of the little mouths of the Arteries into the cavity of the Abdomen) is accounted of easier cure, or at least of more promising hope, than that solitary disease coming from tumours about the bowels, or from the Lymphatick or lacteal Vessels being burst asunder; for as well the conjunct as procatactick cause of the former Disease, oftentimes is used to be removed wholly, or in part; but in the other case, both for the most part exist incurable. A reddish Urine, lixivial, and little, in an Ascites is of ill signification, for 'tis a sign that the mass of blood, being repleated with a scorbutick Salt and Sulphur boyled together, is too much bound up in its substance; insomuch that it doth not well separate the feculencies, nor discharge them by fit and convenient Sinks, which notwithstanding it doth evilly dispose by constraint into the Cavity of the Belly, forasmuch as it is hindered in its Circulation in the very same place. For in an Ascites the blood is not always dissolved as in an Anasarca, but sometimes appears too much compacted in its temper, yet so, that the salt Serum being denyed to the pores of the skin,

and to the Urinary passages, by reason of the Obstructions of the bowels is forced to break out within the abdomen.

If in an Ascites, by a Purge taken, the waters are evacuated with ease plentifully by stool, and from thence the swelling of the belly is somewhat diminished, we are not to despair of the Cure; but if Purgers bring out little or nothing of the Serum, or Lympha, and thence by reason of the Nervous fibres being irritated, and driven into extensions or inflations of the bowels and membranes (as it uses frequently to be) the belly swells the more, and grows like a Drum, we may expect only a fatal event of the Disease.

The Cure of an Ascites.

By what and how many remedies the evacuation of the water is to be endeavoured.

First by purging.

Catharticks are either Vomits or Purgers.

The chief medicines of either kinde.

1. Gammi gutte.

Its various Preparations.

About the curing of the Dropsie called *Ascites* it behoves us chiefly to consider by what ways the waters heaped within the abdomen, may be thence brought out, and evacuated, for such an evacuation ought to be attempted only by possible ways. And here presently is to be observ'd, that the remedies used for Hydragogues according to the ordinary practice of Medicine, intend to accomplish that end by purging, by Urine, by Sweating, and by insensible transpiration: In some cases of the Sick you ought to proceed by this way, and in other cases rather by that way, or another, and if none of these seem feasible, or succeed well, let mature consultation be had for a Paracentesis. It will be worth our labour to weigh every of these kinds of Medicines, and the reasons of every one, and the manner of their operations, and with how much vertue Hydragogues are endowed.

First, therefore as to what relates to purging, we have in another place shewed that, from the irritation of the Physick made in the belly and guts, as well the Contents and winde of these bowels, as moreover the humours driven into their Coats and Glandules, and which are heaped up in the Vessels and Pipes of the neighbouring parts, are disquieted, and partly streined into the passages of the guts, and partly returned into the mass of blood; insomuch that the tumour of the abdomen arising from the stoppage, and as it were a waterish affection of those kind of Parts, is often abated by Purgatives seasonably administred, and sometimes wholly removed; but it doth not so succeed when it proceeds from a Lympha fluctuating within the cavity of the abdomen, or from an inflammation of the membranes, or from a tympanitic extension: because Hydragogues do little or nothing bring out those waters, and if they be of the stronger sort, they encrease this passion and exasperate it by inflaming the part.

Catharticks used for Hydragogues, are either Vomits, or Purgers; they exert their power in the stomach, and these rather in the Intestines; insomuch that they powerfully provoke and twitch the Nervous fibres; and together pour forth the blood and nervous liquor by a certain septick force, and do cause the serous humours wherever impacted to be stirr'd, and do cause them plentifully to be sent away by the passage granted. Either are reckon'd of a various kinde, viz. either simple or compound, gentle or strong, by the Ancients as well as by the Moderns; some of which that are most chiefly noted, we will here briefly observe.

1. *Emetick Hydragogues*, chiefly famous, are Gambugia, Efula, Spurge, and their several Preparations, as also the *Hercules* of *Bovius*, and the *Pilule Lunares*.

2. *Purgers* are Elder, and Dwarf-Elder, Soldanella, Gratiola or Hedge-hyssop, the Juice of *Orris*, and *Elaterium*. We will briefly prescribe some methods either of preparing or compounding or administring each of these.

1. *Gambugia*, first an *Indian* Medicine, being from thence brought by our Countrey-men, from the Painters Shops coming to the Apothecaries, began to be in use, and is much magnified for purging out serous humours. But forasmuch as taken by it self it vehemently disturbs the Stomach, and often weakens it, therefore, that its outrageous and violent vomiting force may be somewhat abated, there are divers ways of its Preparation invented; but truly it is best corrected with an acid Spirit, or with an alcalizate Salt, or by thoroughly mixing and correcting it with aromatics.

Adrian à Mynsicht, extolls the magistrery thereof, which is made by a dissolution in Spirit of Wine, and after drawing it off, and precipitating it with Spring-water; also dissolving it with Spirit of Wine vitriolated, and with Tincture of Roses, and red Sanders, and after by evaporating it: others prepare it with the fume of Sulphur after the manner of Scammonie sulphurated; others grinde it on a Marble, moistening it with Oyl of Cinnamon, or Cloves, or other chymical Aromatics. I use most the Solution thereof made with a tincture of Salt of Tartar, the dose from 15 drops to 20 or 30.

Take

Take of Gum-gutta, gr. 6. Mercurius dulcis gr. xv. Conserve of Violets, a dram and a half, make a Bolus. The forms of Hydragogues prepared thereof.

Take of Gambugia twelve grains, Salt of Wormwood fifteen grains, Oyl of Mace one drop, Conserve of Damask-Roses one dram, make a Bolus: and it is wont to be given with Tartar vitriolate, or Cream of Tartar, and powder of Rhubarb.

Take of Gum-gutta sulphurated, or vitriolated, fifteen grains, Cream of Tartar half a scruple, Extract of Rhubarb one scruple, Oyl of Cinnamon, gut. 2. make 4 Pills.

Lately, a woman afflicted with a most painfull Ascites, and most desperate, as it seemed to me, the ensuing Medicine being taken for 6 days successively, she began to be much better, and in a short time afterwards recovered her health entirely.

Take of powder of Gum-gutta twelve grains, Oyl of Cinnamon one drop, with syrup of Buck-thorn, make a Bolus, the dose daily to be augmented, ascending from twelve grains to twenty.

Take of our Tincture of Gum-gutta one scruple, water of Earth-worms one ounce, Syrup of Rhubarb half an ounce, mix them, and let it be taken with government.

2. Whereas there are several species of Spurge, or *Tithymalus*, and all of them work more violently either by Vomit or Stool, by reason of the notable provocation they make in the bowels; and for that cause do abundantly bring out serous humours; yet by reason of the too outrageous force of many of them, the lesser Spurge for the most part only is now in use, and the preparations thereof most of all magnified are, the powder of the bark of the Roots, and the Extract, and we think fit to adde the tincture inferiour to none of the rest. 2. Spurge. The Preparations thereof.

Take of Spurge with the Roots cleansed four handfuls, Lignum-Aloes, and Cloves, of each one dram, bruise them and boyl them in four pound of Spring-water, to half, the strained Liquor clarify by separation or settling in a long glass, afterwards evaporate the clear liquor in a Bath heat, to the consistence of an Extract, the dose one scruple.

Take of this Extract half an ounce, pour upon it into a matraass of the Tincture of Salt of Tartar 6 ounces, digest them in a Sand-bath to the Extraction of a Tincture, the dose from 20 drops to 30 in a convenient vehicle. Forms.

Take of the Powder of Spurge from seven grains to ten, Cinamon half a scruple, Salt of Tartar eight grains, mix them together in a glass mortar, give it by it self or mixed with a fit Conserve, or Syrup, make a Bolus or Pills.

2. Precipitate of Mercury with Gold, or the *Hercules* of *Bovius* which is much extolled by the Author for curing Dropsies; it is described in a former Treatise in the Chapter of Vomits, and the manner of preparing, and the working thereof, and the Reasons are there delivered. This Medicine, inasmuch as it twitches the stomachical fibres by its acrimony, and pours out the blood by reason of the mercurial and salt particles, causes or stirs up a fierce Vomit, and thereby causes the serous humours, violently strained into the Cavities of the bowels, to be ejected. The Hercules of Bovius.

3. The Pills called *Lunares* produce the same effect in like manner, by reason of the vitriolate particles of Silver sharpened with other saline menstruums, viz. by wrinkling of the fibres of the Bowels very much, they force the serous humours to be strongly strained into their passages, and so to be evacuated. Pillule Lunares.

A Solution of Silver made in Stygian water, and well cleansed, and by a little evaporation is reduced into pleasant Crystals, which by themselves (or with an addition of Salt Nitre to abate the fierceness of the Lunar Vitriol) are made into Pills with crums of bread: the dose is one Pill, sometimes two or three, respecting the ability of strength and working. Medicines of this kinde are exhibited sometimes with success in a strong constitution, and bowels strong, and a good habit; but they are scarce ever conveniently or rarely without prejudice taken by tender and cachectical persons.

Hydragogues meerly or chiefly purging, are either of a more mild sort, as Elder, Dwarf-Elder, Soldanella, and juice of English Orris, which seldom being administered by themselves, do want the stirring up of sharper Medicines, and on the other side they blunt their too much fierceness; or they are of a stronger sort, as *Gratiola* or Hedge hylop, Jallap, and Elaterium. Purging Hydragogues.

The

Elder and
Dwarf-Elder.

The seeds or grains of Elder and Dwarf-Elder being dried, are reduced into a powder, which being taken to the weight of one dram, doth gently bring forth ferrous humours by siege; Water and Spirits are distill'd of the juice of either sorts of Berries fermented, also Robs and Syrups are made of them, which with many other Preparations of those Vegetables, are much magnified for all hydropical Distempers.

Soldanella.

Soldanella and *Gratiola*, are rarely used by themselves in our age, neither are any neat and very efficacious Medicines prepared out of those Simples; they are frequently mixt with certain other Hydragogues, and chiefly are ingredients in compounding Apozems.

The juice of
Orris.

The Juice of *English Orris* is a very profitable Medicine, and because to be easily procured for the poor, is the more to be esteemed: It is given from six drams to an ounce and a half, or two ounces, either by it self in a fit vehicle, or with other things appropriated thereunto. Jalap is a most known Medicine against every Dropsie, and common enough. Any one of the common people suffering under that disease, presently takes of the powder of the root of Jalap a Pennyworth, mixt with Ginger and White-wine, and the desired effect doth frequently follow this remedy used with intermission.

Elaterium.

Elaterium is rightly esteemed the most powerful Hydragogue, for that it most painfully provoking the splanchnick fibres and together melting the blood and humours by a certain corrosive force, compells whatsoever serosities the Coats of the Bowels, Membranes, Vessels, also the Glandules, and flesh do contain in themselves, to be poured out into the cavities of the Stomach and guts: by which Medicine happily working, the asswaging of the Abdomen doth sometimes succeed. Truly this is the chief weapon of the Empirical Magazine against any Ascites; which they notwithstanding using in all cases, do oftener administer to the hurt than benefit of the Patient: the dose is from three grains to ten or fifteen, taken either by it self, only with correcting spices added, or it is given with other hydragogues in form of a Powder, Pills, or Electuary. The tincture and essence of it are extracted with Spirit of Wine, or with tincture of Salt of Tartar.

The forms of
Hydragogues.

These are the chief simple Hydragogues, from which being prepared with the addition of others, many compounded ones as well Magistral as common in Shops are made, and are every where in use; moreover, very many more might be prescribed extemporarily, as occasion serves. Of these we will here annex a few more select forms, and chiefly those that are taken in the form of Potions, Powders, Electuary and Pills.

A Tincture.

Take of Dwarf-Elder, *English Orris*, of each an ounce and half, leaves of *Soldanella* and *Gratiola*, i. e. Hedge-hyssop of each one handful, *Asarum*, and *Asse Cucumber-roots* of each two ounces, roots of lesser *Galangal* six drams, choice *Jalap* half an ounce, *Elaterium* three drams, *Cubebs* two drams, shred and bruise them, and pour upon them three pound of small Spirit of Wine tartarizated, digest it stopt close in Sand for two days, strain it clear and depurate it by settling. The dose from two spoon-fuls to three, in a convenient vehicle.

Powders.

Take of *Elaterium*, *Soldanella*, *Ginger*, of each one scruple, *Galangal*, *Cloves*, *Cinnamon*, of each half a scruple, Salt of Tartar fifteen grains, make a powder for two doses.

Take powder of *Jalap* one dram, *Ginger* one scruple, Cream of Tartar 15 gr. make a powder to be given in a draught of White-wine.

Pills.

Take of *Rhubarb* one scruple, *Elaterium* 5 grains, Tartar vitriolated half a scruple, *Spicknard* three grains, with Syrup of Buckthorn make four Pills.

Take of pill *Aloephagina* half a dram, *Elaterium* half a scruple, Oyl of Cloves gut. 3. make four Pills.

Bontius hydropick Pills are given from half a scruple to half a dram, prepared thus:

Take of *Aloes* two drams and a half, the preparation of *Gum-gutta* one dram and a half, *Diagridium* corrected one dram, *Gum Ammoniacum* dissolved, one dram and a half, Tartar vitriolated half a dram, make a mass, and form it into Pills.

Electuaries.

Certain hydragogue Electuaries are now every where in use and celebrated by practitioners. Of which sort are, 1. One described by the renowned *Sylvius*, and the other by *Zwelfer*. This following pleases us.

Take

Take of Refine of Jalap two drams, Tartar Vitriolate one dram, Extract of Rhubarb two drams, of Spurge a dram and a half, lesser Galangal one dram, beat them in a mortar, and lastly adde of Conserve of the flowers of English Orris, four ounces, and with Syrup of Peach-flowers make an Electuary, the dose from half a dram to a dram and a half, or two drams.

I might here set down or describe many other purging Hydragogues, but Catharticks do not always cure an Ascites, yea often-times exasperate it, and (if they be long continued) render it incurable; hence it is necessary to have recourse to other Remedies for the Cure of this disease. Wherefore, let us next enquire whether Diureticks do here profit or not? 2. Diuretick Hydragogues.

And truly any one may easily think that Remedies moving Urine conduce very much for draining waters out of every place or cavity of the body. In truth it is manifest by frequent experience, these do often cure an Anasarca before any other Remedy; let us see what they may effect for the emptying the Cavity of the Abdomen.

As to this it first appears, that there is no passage immediately open from an Ascitic pool to the Reins, although contiguous; but that whatsoever waters are transferred from hence thither, must of necessity first be drunk up into the mass of blood, and from thence be poured out of its bosom into the sink of Urine; and truly it is but a little which the gaping little mouths of the veins about the superficies of the bowels can receive (if perhaps they are open at all) and Diureticks can but effect this one thing, that by pouring forth the blood, and forcing its serosities more plentifully to the Kidnies, they cause the waters fluctuating in the belly to be allured to it being so empty'd; in the mean time there is no less danger, lest Diureticks being unseasonably administred, while they dissolve the blood too much, they constrain the serum to depart into the seat of the Ascites, more than into the Reins, and so rather augment than remove the inundation of the belly. For that it sometimes so happens, I have often found by experience; wherefore when Diureticks are prescribed to cure an Ascites, we must chiefly provide against such a contrary effect. For this reason indeed Astringents and Corroboratives are always mixt in Remedies for the Dropsie (founded on experience, and the Authority and Practice of the Ancients) not that such (as is commonly said) do confirm the Tone of the Liver, but conserve the temperature, and mixture of the blood, lest it be wholly dissolved by too great a fusion. Wherefore in an Ascites which chiefly or in part happens by reason of the frame of the bowels and vessels, and chiefly the Coats, Glandules, and their little strings, and their interspaces being stuffed by a serous humour, and therefore very much swell'd up, as Catharticks so also Diureticks profit, and are frequently taken with success; forasmuch as by the use of these the masse of blood being empty'd (the serum being more plentifully derived to the kidneys) doth easily receive unto it self those waters every where stagnating about their little mouths, and conveys it towards the urinary sink: but on the contrary, in a meer Ascites where the heap of waters do overflow the Cavity of the Belly, the Textures of the bowels being free from the serous stuffing; Diureticks are given in vain, or incommodiously; inasmuch as they express nothing from this Lake of the belly, and most frequently by dissolving the blood more impetuously drive together the waters apt to be infill'd there. What Profit they bring in an Ascites.

Not all Diureticks of every kinde are equally convenient in an Ascites, neither ought they indifferently to be administred; for we must observe, the affected in this disease for the most part make a little, reddish Urine, and as it were lixivial; which truly is an indication that the temperature of the blood is too much bound in them, by reason of the fixt and sulphureous Salt exalted and combined together: and therefore that the Serum is not duely separated within the reins; which notwithstanding is shook off about the windings of the obstructed bowels, and so is deposited in the Cavity of the Belly. Wherefore in this Case it will be convenient to drink only those things to excite Urine, which so restore and amend the Constitution of the blood, that the enormities of the fixed Salt and Sulphur being taken away, the serous part might be separated within the reins, and more plentifully discharged; for which purpose, not acid or lixivial things, but those endowed with a volatile Salt are appointed. For I have often observed in Patients of that kind, when the Spirit With what choice and difference they ought to be administred.

John English
his Empyrical
remedy.

of Salt, and other acid drops of Minerals, and when the dissolutions and Deliquiums of Salt of Tartar, Broom and other things, have done more hurt than good, that the Juice of Plantane, Brooklime, and other Herbs abounding with a volatile Salt, have much helped, as also the expressions of Millepedes: for the same reason Salt of Nitre thoroughly purified or Crystal Mineral doth often profit. Forms of Medicines more accommodate for this use are extant in our former Treatise, where, viz. examples of Diureticks are described, in which both volatile and nitrous Salts are the Basis. Moreover, hither ought to be referred the notable experiment, by which *Joannes Anglus* affirms himself often to have cured the Ascites from a hot cause, which Medicine also that expert Physitian Dr. *Theodore Mayern* was wont to magnifie and prescribe in the like case.

Take of the juice of Plantane and Liverwort, and fill an Earthen pot to the top, which being stop'd close, put in a hot Oven after the Bread is drawn, and make a little fire on the sides of the pot to continue the heat of the Oven; after it is so boyl'd strain it, and being sweetened with Sugar, drink of it Morning and Evening, and it cures. In imitation of this I have often with success prescribed as followeth.

Take of green Plantane-leaves four handfuls, Liverwort, Brooklime, of each two handfuls, bruise them together, and pour upon them half a pound of small compound Radish-water, or other appropriate Magistral, express it strongly, the dose three ounces three times in a day.

How beneficial
Diaphoreticks
are in an Ascites.

Although Diaphoreticks are most efficacious in an Anasarca, yet in an Ascites they are rarely or not at all used: for being unseasonably offered, they impress oft-times great hurt on the Patient without any avail; forasmuch indeed as by heating the blood, they cause the fluctuating waters to grow hot, and as it were to boyl in the hollowness of the belly; so that the spirits and humours are disturbed by vapours raised from thence; and so a disorder of all the functions follows, and the very bowels being as it were boyled, are much prejudiced. Moreover from sweating unadvisedly instituted, the blood being forced into a fusion and precipitation of the Serum, throws it off the more into the nest of the Ascites. Wherefore when some prescribe fomentations, and liniments, and bathing, to be applied to the swelling Paunch of the Belly, for the most part it turns to the worse in such Patients; for besides a little Fever, a Vertigoe, fainting of the spirits, and other ill symptoms of the brain and heart, being most frequently so raised, even the belly also doth from thence swell the more: forasmuch as the Blood being agitated and poured out, deposits in that place more largely the Serum; and for that cause the mouths of the Vessels are more loosened and opened, so that they may more readily let fall water prone to depart from the mass of blood. But the Remedies which are chiefly wont to be administred with success near the places affected (when a Cure is intended without a Paracentesis) are Clysters and Plaisters.

Clysters and
Plaisters.

The former draw the Serum out of the Vessels and Glandules of the Guts and Mesentery without fusion of the whole mass of blood, (which the stronger purging Medicines do excite,) which being so emptied do imbibe a little the extravasated Lympha. For this purpose the ensuing Clyster, wont to be prescribed by us in this case, is most fit, in regard it contracts the intestinal fibres together, and draws the Serum imbibed by the blood, or contained formerly therein, towards the Reins.

Forms thereof.

*Take a pint of Urine of a sound man that drinks Wine, Venice Turpentine dissolved with the Yolk of an Egge, an ounce and a half, Sal Prunella one dram and a half, make a Clyster, which repeat daily. Sometimes Plaisters yield help in an Ascites, yet let them be such, as by a certain restraining and comfortable virtue strengthen the bowels and bind together the mouths of the Vessels, lest they too much issue out their serosities: for this purpose, I use to apply the Plaister *Diasaponis* with successe. Or,*

Take of the Plaister of Minium, Paracelsus Plaister, of each what suffices, make a Plaister to be applied to the Abdomen. If this disease is accompanied with a Tympanie, Epithemes of another manner are fit, as we shall hereafter declare.

The great and most present remedy of an Ascites, is, that the waters may be drawn out by a Paracentesis being made; which administration however doth not oftner cure the disease, than kill the Patient; wherefore there is need of exact caution
to

to whom, and at what time of the disease it ought to be administred: to persons of an ill habit, who have been long ill, in whom the conformation and temper of the bowels is wholly depraved, it will be in vain to have the Lympha drawn out by the Paunch being pierced; for thereupon immediately the Spirits faint and the strength is dissolved, and after a while a new illuvies of the morbidic humour succeeds. But those who being formerly of sound bowels, and healthful enough, as to other parts, when they fell into an Ascites from some great and evident cause, as we are not at first presently to make a Paracentesis, so neither if it be needfull ought we to deferre it too long: for an incorrigible depravity of the Bowels is contracted by a longer delay, while they remain a long while drowned, and as it were boyled in water.

When and to whom a Paracentesis is convenient in an Ascites.

It is beside our purpose to describe here the administration of a Paracentesis, whether it be done after the ordinary manner, or by a hollow Needle according to Sylvius; this part of Chirurgery, as dangerous, when Physicians seldom prescribe, yet Quacks and Empiricks rashly and unluckily essay it, Artists not being consulted: we will relate here for conclusion the History of a true and huge Ascites, lately cured without any Paracentesis.

A young Woman wife to a Merchant, being slender and proper, while she gave suck to her Child, to encrease her milk day and night did immoderately guzzle one while plain Ale, another while Posset-drink. After having used this kind of dyet for a fortnight, she contracted a vast Ascites in a short time, the beginning whereof she was not in the least sensible of; for her Abdomen being great with water fluctuating within, did much swell up, and its bulk when she turned from one side to the other, fell without the Ileon and borders of the rest of the body: when in the mean while the flesh of all her Members was very much consumed, that she seemed no less in a consumption than a Dropsie.

A history of a cure.

The Child being weaned, and a better course of Diet being appointed, she betook her self to Medicines, and took in the first place the more mild Hydragogues, as well purgative as diuretical, but without any advantage; also she was worse after every purge; but being committed to our care, and almost desperate, I handled her after the ensuing method.

I prescribed these Medicines, for the most part forbidding Ale, and any potent liquor (medicines excepted.)

Take of the leaves of Plantane, Brooklime, Clivers, of each 4 handfuls bruised, and pour upon them of water of Earth-worms and Rhadish compound of each three ounces, press them, take it twice a day, viz. at Eight in the Morning, and at Five in the Afternoon. She continued long in the use of this Medicine, but did sometimes vary the Composition, sometimes changing the herbs, sometimes the Liquor poured on them.

Take of the reddest Tincture of Salt of Tartar an ounce and a half, she took 20 drops at night, and early in the morning, in two spoonfuls of the following Julep, drinking seven spoonfuls after it.

Take water of Elder-flowers, Saxifrage, of each six ounces, water of Snails, Earth-worms, and Rhadish-compound, of each two ounces.

She wore a Plaister of Minium and Oxyroceum upon her Belly.

The following Clyster was given first daily, afterwards every two or three days.

Take Urine of a healthy man one pound, Turpentine dissolved with the Yolk of an Egg an ounce and a half, Sugar an ounce, Sal Prunella one dram, make a Clyster.

By the constant use of these things her Belly asswaged within a fortnight, but her flesh daily wasting, a Consumption was threatned. Wherefore, going into the Country to avoid this, she drank Asses milk; by the benefit of which Nutriment and of purer Air, continually taking the above-mentioned Medicines, she recovered her entire health within three or four weeks, and lives yet in health.

SECT. II. CHAP. IV.

Of a Tympanie.

A Tympany not properly a kind of Dropsie.

A Tympany vulgarly, although not properly, is esteemed a kind of Dropsie, from which rank, *Prosper Martianus* alleading the testimony of *Hippocrates*, rejects as well this Disease, as an *Anasarca*. But the former infesting the region of the Abdomen, and raising it up into a bulk, now comes under consideration next after an *Ascites*, (to which it is something a-kin): where first of all it is obvious, that this Disease as it is most difficult to cure, so also to be known; for although its outward form, *viz.* a somewhat hard swelling of the belly, very stiffe and yielding a sound like a Drum, upon touching it, is evidently perceived by many senses together; notwithstanding what may be the morbidick matter inducing that Tumour, or after what manner it is generated in the belly, or from what place it comes thither, is altogether unknown: therefore those who have a Tympanie, as though they were big with winde, are ignorant both of the manner and time of its conception. Truly I therefore judge the nature and causes of this disease to lye concealed, because whereas its first beginnings are not observed, it suddenly augments prodigiously; so that they who are affected, do scarce sooner perceive themselves to be sick, than that they are become almost incurable. Moreover, a Tympanie, its station being accomplished, degenerating into an *Ascites*, or rather procuring it to its self, seems to lose its own nature; and truly after death Anatomical inspection scarce discovers any thing more in bodies dying with a Tympany, than with an *Ascites*. But that many Physical Authors do readily declare this Distemper to be raised by wind enclosed within the cavity of the abdomen, doth not at all satisfy a mind desirous of the truth; because it seems altogether improbable that winds should be produced so suddenly, and in so great plenty in that place; or admit they were, that so hard, unmovable and constant a tumour should be raised.

wherefore its cause is occult.

Commonly ascribed to Winde.

Authors do not agree about the seat of the Windes.

Not without the guts in the cavity of the Abdomen.

Nor within their passages.

Not between the coats of the bowels.

Moreover they do not easily agree concerning the seat of the disease, where the wind is supposed to be included; for some affirm that this place is determinate in the concave of the *Peritonæum*, and by the convex superficies of the Intestines, and other bowels of the lower part of the belly; but after what manner such a heap of winds can be therein collected, in my opinion it cannot be manifested by any reason, example, or parallel instance. Besides, if the case were such, it might be more easily cured by pricking, than an *Ascites* by a *Paracentesis*; which yet I never heard accomplished. *Helmont* reports a stinking wind was vented by a *Paracentesis*, in one esteemed *Hydropick*; that suddenly his abdomen sunk, and the man dyed immediately. But *Platerius* and *Smetius*, no less worthy of credit, do affirm, *They discovered in some who were thought to have the Tympanie, and dissected after death, that no wind broke forth out of the hollow of the belly, neither that it fell, but that especially the smaller guts being distended, and strutting with winde, burst out so, that they could not be put up again into the same belly.*

But truly neither is this observation an argument to me, that the cause of the disease (of which we treat) remains within the Cavities of the guts, and that the winds accumulated in that place, do often or most of all raise a Tympanitick swelling of the belly. For besides that, a disease taking rise from such an occasion, would not be so immovable, and frequently incurable; moreover, I am induced to think, that the Intestines are not so greatly dilated by winds shut up in them, but that they often of their own accord swelling out, give occasion to those winds consequently and secondarily to be produced, by which the spaces enlarged might be filled, as we shall by and by more clearly demonstrate.

But what is asserted by others, that the windes which are the cause of a Tympany, are engendered among the Coats of the Mesentery, and Guts, seems yet much more improbable; because when there is no cavity in that place preexistent, after what manner can the winds so tear those parts and separate them from one and another, so that from such formed Denms, the whole region of the Belly should grow into so vast a bulk by accumulated windes there laid up? Certainly so many and so great divulsions could not be made without continual torment and most sharp pains.

Where-

Wherefore, omitting these opinions already spoken of about a Tympanie, let us proceed another way to the more assured searching out its Pathologie; viz. by thoroughly weighing by what means, and by what evident causes, the Abdomen is wont to swell up. Wherefore, we advertise there are four kinds of things contained, from which proceeds a tumour in the nether Belly of the living, (why the Abdomen swells in dead persons, the reasons follow hereafter) which kinds are, solid, humid, wind and Spirits.

First, It is obvious enough, that the inward tumours of the bowels, viz. scirrhus, strumous, cancrus and glandulous, and some perhaps of another kinde, when they rise to any notable bulk, do swell the whole belly; yet in the mean time as long as they are simple, and new, they may be perceived and circumscribed by the touch; yet afterwards growing inveterate, they cause other evils to the neighbouring parts, yea over the whole Region of the Abdomen. Truly these as they are sometimes the procuring cause of an Ascites, so of a Tympany from the beginning, to which afterwards for a complement of either disease, another conjunct cause gains access, viz. an illuvies of waters, or an irregularity of the Spirits.

Secondly, a watery humour gathered within the Cavity of the abdomen, or being impacted in the membranous or glandulous parts thereof, frequently produces an Ascites, the reasons whereof, and the manner of its coming to pass, are at large set down before.

Thirdly, Winds within the bowels of Concoction being raised from crudities, ill concoction, or fermentation of heterogeneous humours, do frequently puff up the Cavity of the guts, and for the most part produce a short and transitory tumour of the belly. For the fermentation of the Juices ceasing, and eruption of wind being procured, immediately succeeds an allwaging of the Belly. To this cause, both the Colick and Tympanie, not only by the vulgar but by Physicians of great note are imputed; but in our judgement, when it is solitary it produces neither of these distempers.

Fourthly, There yet remains another sudden, and vast swelling of the belly, which the animal Spirits, (not for nothing styl'd by Hippocrates violent) seem to procure. For when these in heaps, and inordinately, rush into the nervous fibres belonging to the bowels of the lower belly, presently the parts that these weave together are caused to be puffed up, and extended every where round about. For truly, from this cause (as we have often shewed in another place) a swelling, and as it were a tympanitical puffing up of the whole abdomen, as well in the Colick as in Hysterical fits vulgarly so called, doth often happen. And truly these distempers are so allyed to a Tympany, that they frequently end in it; for I have oft observed, that those who have been obnoxious to the Colick and hysterical passion long and grievously, unless they receive cure, do become Tympanitical. And then the greatest of the difference will be, that the swelling of the belly, which before was a wandering Symptom, and soon passing over, at length grows to be a fixt and permanent disease.

Wherefore, it seems material in this Case, to accommodate the Ætiologie of those passions delivered by us in another place, to unfold the Nature and Causes of this present maladie.

Which truly will not be of any great business or difficulty. For supposing (what we have in another place more largely set down) the extensions and inflations of the membranes and hollow bowels, take their origine from the impetuous invasions of the Spirits into the nervous fibres (of which they are interwoven) it will be obvious enough to conceive even a Tympanie to be produced from such a cause, but being more fixt, and longer, or uncessantly in the act; into the reason of which difference, we will by and by inquire.

In the mean time I am induced to believe a Tympanie not to be stirred up from winds shut up within, or without the Cavity of the guts, (for such an accumulation of winds in those places, is an effect, but not a cause of this disease) but that it does arise, inasmuch as the animal Spirits, in the bottom of the belly, belonging to the membranous bowels, being forced into disorder by something incongruous, do tumultuously rush every where into the nervous fibres, and puffed them up, neither do they immediately recede back from them: from hence the Peritonæum swells, and the guts being blown up and enlarged, they are as it were inflated, the Mesentery, and other membranous bowels, being turgid with an impetuous Spirit, are as it were raised up into a bulk; moreover, while these come thus to pass, that the vacuities caused from the swelling of hollow bowels might be filled, a portion presently

By what and how many causes the Belly swells.

1. From tumours of the Bowels in that place.

2. From waters gathered as in an Ascites.

3. From winds.

4. From the inflation of the Fibres, by reason of the Spirits being disturbed.

An Affection of what sort a Tympany is.

Its cause and formal reason explicated.

of every humour within contained, being rarified into vapours, forthwith turns into wind, wandring about those empty spaces.

And proved by arguments and instances.

An universal Tympanie.

Truly, we have clearly enough shewn, by reasons and instances in our Pathologie of Convulsions, that the animal spirits puff up the membranous parts by their irregularity, and so produce as it were this windie Distemper. Moreover the same is demonstrated by Anatomical observation made in dissecting a living Creature; viz. inasmuch as the Trunk of the eighth pair of Nerves, descending on each side by the Neck, if it be taken out and bound with a thred, forthwith all the stomach swells up, as if it were puffed with winde; which certainly can proceed from no other cause than that the animal Spirits of the fibres of that bowel, and others flowing through the nervous passages, (inasmuch as they being cut off from their origine, are driven into confusion) do tumultuously enter those parts, and puff them up. Besides these, for the further illustrating of this Hypothesis, I will relate a History cited by the most renowned Smetius, of an universal Tympany (as he calls it) in a certain young man of Liege: Who when he had received, in a conflict, under his right arm-pit, a wound, made by a prick, penetrating into the Cavity of his breast; next day and night being past, he appeared in the morning after swell'd throughout his whole body, not only in his breast, but also in his back, belly, loins, and in the coads, besides both in his arms, shoulders, neck and face, that he could not open his eye-lids, also on the crown of his head, the skin being every where swolne and tumefied, the tumour was every where extended with great pain. The Author calls this wonderful affection, an Universal Tympanie. The most renowned Sennertus relates a Case like this from his own knowledge: Moreover, I remember I have heard or read of the like from a wound of the breast being received near the arm-pit.

The Cause of an universal Tympanie enquired into.

Notwithstanding, the reason of this Symptom, deliver'd by Smetius, and approved by Sennertus, doth not at all please me: for they ascribe the cause of that general Tympanie to the puffing up of the breast, by the axillary wound, made all that night under the skin, as we see a new and moist bladder to be blown up by boyes with a quill: which truly doth not only seem improbable, but also we think scarce possible, that the wind to be blown out of a wound of the Thorax, by reason of the hole one night stopt, can enter the skin, and from thence passing through the whole body, should make it become every where Tympanitical: For besides that the wind cannot so suddenly pass from thence into all parts, although it should be blown with a quill from the mouth, under the skin; besides, while the orifice of the wound is stopt, no wind can altogether be blown out from the Cavity of the breast, because none in the mean time enters. But assuredly the cause of that wonderful affection is this; (whence also the formal reason of a Tympanie is illustrated) In the Breast near the Arm-pits, are many and eminent foldings of Nerves, (as we have described in our Treatise of Nerves,) by which the nerves of the whole body communicate among themselves: viz. the Trunk of the eighth pair unites with the intercostal Nerve, and both with the nerves of the Spina Dorfi, by branches and sprigs sent here and there. Wherefore, this nervous folding, perchance being pierced by the point of the Sword, first of all the spirits residing in that place being provok'd, run into disorders, afterwards a consent being immediately made thorow so many notable Nerves, and transmitted to and fro every where, other Spirits, and then again others, are sensible of the like irregularities, and puffing up the membranous and nervous Fibres (which every where they enter tumultuously) they induce as it were a tympanitical affection through the whole body. By reason of the like fury or virulent madness imposed upon the Spirits, in any place, and from thence immediately diffused far and wide, certain Poysons being drunk, the strokes of weapons, or of wild Beasts, or a venemous bite, do frequently induce a swelling together of many parts, or of the whole body; which swelling distemper of the Spirits, is styl'd by Helmont to be *Indignatio Archaas*. There are many other Cases and Instances, by which it is most clearly evinced, that the Animal Spirits being provok'd, and driven into angry inclinations, inasmuch as they do more impetuously enter into the nervous Fibres, are wont first to swell the membranous parts, and to excite many passions out of those, which are vulgarly but falsely ascribed to windes: so that in truth no other cause of a Tympanie can be assigned more like truth.

The true cause assigned.

Why the belly swells in the dead.

If it be objected, that the Paunches of the defunct after some time are raised by winde into a bulk, and swell like as in a Tympany: I pronounce this to proceed from the putrefaction of humours, and the extream dissolution of the mixture, wherein

all the active particles depart, being freed one from the other, and flying about seek vent in every place, and distend greatly all obstacles, and chiefly the sides of the Cavities, (which doth not at all happen in living bodies;) wherefore, as all Carcasses do not putrifie alike, so their bellies swell sooner or later, more or less: But while life endures, no rottenness or dissolution of particles is made in an animated body, that can bring about a splanchnick fermentation or swelling. In the mean while we deny not, that winds are generated within the offices of concoction, fanguification, and separation, yea within all the particular cells and recesses of our whole body; notwithstanding from them all, unto the winds wheresoever engendred (whilest the Spirits have their due influence, and actuate the nervous as well as moving fibres, that the sides of the bowels be not kept distended and rigid) an easie vent does every where lye open. And the truth is, in a Tympany, we allow the wind to fill up the empty spaces, but the spirits, inasmuch as they extend the bowels by their irregularity, do first cause those vacuities, (wherein the winds secondarily and consequently are engendred) and they (inasmuch as the same bowels are still kept struttred and distended) do hinder those winds from being removed.

And now I judge it is plain enough by what we have said, that the animal spirits rather than the wind do raise swellings of the belly in that sort; at least such short and transitory ones, as happen in Hysterical and Colick fits. Notwithstanding there yet remains a great difficulty, after what manner the Tympanitical swelling of the Abdomen, which is fixt and permanent, yea for the most part immovable, can proceed from any such cause; especially, because the Animal Spirits being of their own nature active and very apt to motion, do for the most part so affect removal, that unless they be wearied or become defunct, they scarce ever lie still.

The Animal Spirits and not winds the cause of the Tympanie.

That I may loosen this knot by reasoning, it becomes us to consider the Nervous Juice together with the substance of the Animal Spirits, which is every where a vehicle to them, and also a bridle: for the Spirits enjoying the most subtile stream thereof, do freely expatiate, and lest being dissipated from one another, they might fly away, they are contained in an entire series. When therefore that Juice is faulty as to its temper or motion, immediately the animal spirits become diversly delinquent, or are perverted in the exercises of their functions, as we have at large expounded in our Treatise of Passions. And lest by repeating them now I should make long Preambles, I will contract into a few words what belongs to the present purpose.

Wherefore in the first place, it is to be observed, that the contents of the nether belly (excepting only the Liver, Spleen, and Kidneys) are furnished with many membranous bowels, (which the nervous fibres for the most part weave together) whence it follows that the nervous Juice (whose journey is longer, and the passages straiter in these parts) doth find here many remora's: which also may be proved from the effect, forasmuch as the convulsive invasions, every where stirr'd up in the Hypochondriack, Colick, Nephritical and Hysterical Passions, do so grievously infest the Abdomen. When therefore that Juice watering the nervous fibres of these parts, shall be either viscid or tenacious of it self, or fill them with very many feculencies, for that cause it will come to pass, that all the animal spirits will not easily return from thence as oft as they are hurl'd into these fibres, in some part obstructed: and when in this manner there is a full incurfion, and a small return of them, at length it will happen that great abundance of the spirits remain in these fibres every day more and more impacted, and hold them always distended and very much puff'd up; and at length by reason of the ways of their ingress and regress in those fibres being obstructed, they become immovable in that place, and keep the affected parts always extended and stiffe: in the mean time because these Spirits there impacted within the nervous passages, and cramm'd thick, have commerce with others that flow to them in their dens, therefore the affected part although it be stiffe and almost immovable, yet however enjoys sense. This Pathologie although it may seem to some a Paradox, and uncouth, I doubt not but it will deserve assent from many, if it be thoroughly weighed, that those who have been a long time obnoxious to Hypochondriack, Colick, and other convulsive distempers of the nether Belly, do at length become sick of a Tympany.

This happens by the fault of the Nervous Juice.

By the obstruction whereof the Spirits within the fibres are detained and made immovable.

The formal reason and conjunct cause of a Tympanie being delineated after this manner, before we proceed to trace out diligently the more remote causes thereof, it may be lawfull for us from what we have said to deliver a definition, or at least a certain

*A description
of the disease.*

certain description of this disease, viz. *That it is a fixt and constant Tumour of the Abdomen, equal, hard, stiff, and yielding a noise upon striking, taking its origine from a convulsive inflation of the parts and membranous bowels, by reason of the Animal Spirits being driven into those fibres in too great abundance, and through the fault of the nervous juice obstructing, being hindered from their return back; to which disease consequently an accumulation of winds in the empty places, accrues as a complement.*

*Its procuring
causes.*

As to what appertains to the procuring and evident causes of this disease, it very seldom happeneth that they are altogether observed, but that insinuating it self by silent beginnings, it frequently is finished, or becomes deplorable before it is perceived; insomuch that against this disease scarce any antidote can be appointed; for while the ordinary functions are not much prejudiced, the swelling of the belly is presumed only to have its origine from wind, and while it is expected to vanish spontaneously, it often grows into a Tympanie. Wherefore that we may have timely notice of its beginning, we may take notice, that some previous affects dispose to it; of this sort is first an Hypochondriack, Colical and Hysterical disposition, yea and sometimes an Asthmatical; whose fits when they are used to be frequently raised, if at length a tumour of the Abdomen follow it, though it be small in the beginning, a Tympany forthwith may be feared. Of the former of these affects cases every where are to be met with, and stand fair to common observation: of the later Scherichius reports, *That a man of Sixty years of age was infested with this symptome some months before his Belly was swell'd into any manifest tumour, that as often as he sate at meat, beginning to eat, also when composing himself for sleep, he began to sleep soundly, he was surprized with such a difficulty of breathing, that the frequency of it threatened the danger of choaking; at which time also he perceived a certain palpitation about the Hypochondria, as if some living Animal were underneath the midriff; this distemper afterwards ended in a Tumour of the Abdomen, by which he dyed.* In this and other cases now cited the same reason holds, viz. that the animal spirits being used to make irregular excursions into the nervous Fibres of the lower belly, at length do not only more often and abundantly enter into them, but being impacted and hindered they abide in them, and so at length induce tympanitic inflations of the bowels. Truly this morbid beginning happens sooner or later, if thereupon do come the evident causes, which disturb the Spirits in the bottom of the belly, and compel them to frequent disorders, and also do either stop the motion or pervert the temperature of the nervous Juice flowing within those Fibres; in which rank are accounted irregularities in the fix Non-naturals, immoderate Passions, and chiefly of grief, and usual evacuations suppress'd, drinking of cold water after some great heat, or any sudden cold induced on the belly, either from air or water.

*Other previous
convulsive af-
fections.*

*The case of an
Asthma ending
in a Tympanie.*

*The evident
causes of this
disease.*

*The Prognosticks
thereof.*

The Cure.

As to the Prognosticks, this disease is always accounted of so bad an omen that commonly the name is abhor'd, insomuch that frequently when there is no suspicion of ill from the tumour of the belly, if perhaps that swelling be call'd by the Physitian, a Tympanie, forthwith it is concluded desperate. Notwithstanding this Disease rarely kills of it self, but being protracted a long space of time, that it may at length more certainly kill, it gains to it self an Ascites, as a Harbinger of Death. That we may search into the reason thereof, it will be obvious enough to conceive, while all the bowels are distended in the lower belly, and are held as it were stiffe, the passages of the blood, and nervous and lymphatic humours, being too much extended, or compressed are much straitened, and for that cause cannot freely and readily transmit its Juice; from whence it follows that every humour being straitened in the passage, that at length it may pass by some means, it shakes off a certain serosity from its masse wherever way is given; and those droppings of the humours falling into the hollow of the Abdomen, excite an Ascitick Dropsie.

What relates to the Curatory part of this Disease, the whole scope of healing is commonly bent against wind, viz. Indications inculcated by practical Authors suggest the matter to be evacuated, from whence the winds are raised, and to remove the cause that lifts them up, and the winds to be discuss'd and dissipated, which do already distend the belly.

For these ends Purgers appointed against the humour chiefly suspected are wont to be prescribed with great confidence, although with small or ill success; that is to say, Phlegmagogues so called, another while those that purge Melancholy, another while those that purge Choler, whereto also are joyn'd purgers of water (as weapons intended against every enemy.) For this disease (as is manifest by our observation) is

wont

wont for the most part to be exasperated with strong Purgers, and seldom alleviated; the reason whereof is evident enough, because the nervous fibres being provok't by a sharp Medicine, the animal Spirits renew their irregular excursions, and do every where more and more stretch them out, rather than give any remission to them; wherefore, although frequent and abundant watery and flatulent stools are procured, notwithstanding the Belly swells the more. Moreover, to dispell, discusse, and bridle the winde, there is a more than Æolian power prescribed; Medicines commonly call'd *Carminatives*, almost of every kind or form are sedulously administred, within and without, above and beneath, and upon the part affected; notwithstanding this disease for the most part is untamed by all these; whence we may suspect, that the true cause of the disease lyes as yet conceal'd, because Medicines profit not that are administred, indicated or suggested according to the ordinary Ætiologie or reason of it.

Remedies designed against Wind profit not.

Although I cannot challenge a better success in curing this disease, or a more certain method of healing, attested from experience, notwithstanding in the mean while we will here proffer another way of curing, accommodated to our Hypothesis, and established by reasons strong enough.

Wherefore in a Tympany, as in most other affections, there will be three chief indications: Whereof the first, and chiefly insisted on, is the Curatory, that by recalling the animal Spirits from their convulsive affection, and reducing them into order, endeavours the removal of the swelling of the Belly. The second Preservatory, which restrains those or other Spirits from their irregular excursions into the lower Belly, and together corrects the faults of the nervous liquor, watering it, both as to its temper, or motion. The third Vital, by removing the Symptoms urging, doth succour and sustain all the functions oppressed or weakened, as much as possible may be.

3. Curatory Indications.

I. The first Indication is of greatest moment, on which the hinge of the whole Cure turns, but it is most difficultly performed, for it doth not easily appear by what remedies or ways of administration it ought to be attempted, when most weapons or medicines do little or nothing prevail against this inviolable enemy. Phlebotomie affumes no place here, but is declined for the most part as prejudicial; also Catharticks, inasmuch as they provoke the affected fibres, and disturb the Spirits, and hurry them more impetuously, do increase rather than diminish or cure the Tumour of the Belly; in like manner Diaphoreticks impell the Spirits and the morbid particles deeper into them, whereas they ought to be allured, and call'd out of the Fibres. The chief order of healing seems to be placed in Diureticks and the use of Clysters; and also great things are expected from topical Applications, because they are more immediately exhibited to the disease, and as it were by contact, and because they do best discusse Tumours in other places. Yet not all Dissolvents are here fitting, nor those which profit most in other Tumours; for the more hot being given for discussing, whether they are applyed by fomentation, Liniments, or in the form of a Cataplasim or Plaister, oftner afford hurt than succour in a Tympanie; for they both open and dilate the passages of the fibres, that from thence they may lye more open to the incursion of the Spirits; and also rarifie the particles impacted, so that while they occupy a larger space, an inflation and intumescency of the Belly is augmented. Lastly, what appertains to Alteratives which succour against other affections of the nervous kinde, only a certain few are fit in a Tympanie; for where the morbid matter sticking within the straiter passages cannot be impell'd straight, or throughly, Elastic medicines render the stoppage greater and more fixt, by enfixing the matter deeper; wherefore Spirit of Harts-horn, of Soot, of Sal Armoniack, yea also Tinctures, Elixirs, and other Medicines endowed with a volatile Salt, or active particles of another kind, do not only acquire heat, and a troublesome thirst in the sick person troubled with a Tympanie, but also cause the Abdomen to swell the more, inasmuch as they melt the blood and nervous Juice, and stirre the Spirits, inasmuch that the particles deposited by each of these, are compell'd into the parts affected.

The first Indication hardest.

What, and what sort of Medicines are good or hurtful in this Disease.

But truly although Medicine doth so little avail against this disease, it is not altogether to be neglected, (as if either it effected nothing, or what is ill,) but it behooves us to turn every stone, that by some means we may succour the Patient, and at length may obtain a cure for him, or at least an alleviation. Wherefore in the first place (because it is the custom to begin with Purgatives) although the stronger do ever hurt, and the gentler scarce ever prevail to discharge the conjunct cause, notwithstanding these latter, inasmuch as they do something substract the nourishment of the disease,

Only mild Purgers and Clysters are convenient.

also

also make a way by which other Medicines do exert their powers, they ought to have their turns in physical practice once in six or seven dayes; and at other times let Clysters (whose use is much better) be frequently administred. Hydroticks being prohibited, we must rest upon moderate Diureticks, whereto are adjoynd things respecting the alteration and reduction of the Spirits and Humours, which truly make up the Tympanitical pharmacy. Moreover in the mean time the use of Topicks is not to be neglected. We will annex certain select forms of Medicines appropriated for every of these purposes. For a Medicine mildly solutive, let the laxative Wine be used, prescribed by the renowned *Greg. Horstius* for a Tympanie, in his book of Observations, lib. iiii. Chap. xxx. or in its place let the following be prescribed with greater ease.

Forms of Medicines.

A solutive liquor.

Take the leaves of Peach-flowers, of Damask-roses, of each two Pugils, Broom, Elder, Centaury the lesser, of each Pupil 1. the leaves of Agrimony, Roman Wormwood, of each one handful, Senna one ounce, Rhubarb six drams, Carthamus-seeds half an ounce, Dwarf-Elder two drams, yellow Sanders three drams, Galangal two drams, slice them and bruise them, put them into a silk Bag in a Glass, with 2 pound of White-wine, Saxifrage-water one pound, Salt of Tartar one dram and a half, let them stand 48 hours, let the patient drink from four ounces to six, every third or fourth day.

In a hotter Constitution let the following form be taken, which I have proved with success in this disease.

Take of purging Mineral waters eight pound, Salt of Wormwood two drams, let it evaporate in a gentle Bath to two pound. To this I use to adde four ounces of water distill'd from Purgers with Wine; the dose from four ounces to six.

Or to the two pound of evaporated water adde of Mechoacan, Turbith, of each half an ounce, Rhubarb six drams, yellow Sanders two drams, Cloves one dram, digest them close and warm for two hours: filtre it through Paper, the dose 3 or 4 ounces.

Clysters are of frequent use in this Disease, inasmuch as they loosen the Belly without any great irritation of the fibres.

Clysters.

Take of the Infusion of Stone-horse dung with Camomile-flowers a pound, Mellis Mercurialis two ounces. After the same manner Decoctions and Infusions are prepared, with Carminatives, from Dogs-dung.

Take of the Emollient Decoction one pound, Sal Prunella, or Sal Armoniack from one dram to a dram and a half; make a Clyster.

Take of sound Urine one pound, Sal Prunella one dram, Venice Turpentine dissolved with the yolk of an Egge, an ounce and a half: make a Clyster.

Diureticks.

2. Diureticks if any other Remedies promise help in this Disease.

Take of Millepedes living and cleansed three ounces, one Nutmeg sliced, bruise them together, and pour upon them one pound of the Diuretick water prescribed below: Press them strongly, the dose from three ounces to four twice a day.

Distilled waters.

Take of green Juniper-berries, and Elder-berries, of each six pound, of Firre-tops four pound, green Walnuts two pound, Cortex Winterani four ounces, the outer Rinds of six Oranges and four Limons, Seeds of Ameos, Rockets, Cresses, of each an ounce and half, Dill-seeds two ounces, slice them and bruise them, and adde of Posset-drink made with White-wine 8 pound, distill it in common Organs, let the whole liquor be mixed.

Pills.

Take of Cryстал Mineral half an ounce, Volatile Salt of Amber, two drams, the powder of Carrot-seeds one dram, Turpentine of Venice what suffices to make small Pills, the dose Numb. 3. in the evening and morning, drinking after it three ounces of the distilled water.

Spirits.

Take of the sweet Spirit of Salt half an ounce, take six drops to twelve, twice in a day, in a draught of the same water, with a spoonful of Syrup of Violets.

Take of spirit of Salt of Tartar one ounce, take one scruple to half a dram, twice a day, after the same manner; So also spirit of Nitre, and Tincture of Salt of Tartar may be taken.

An Expression.

Take of Plantane, Chervil and Clivers-leaves, of each four handfuls, bruise them, and pour

pour on them a pint of the former distilled water. Press them strongly, the dose three ounces, twice or thrice in a day with other Medicines.

Take of Grass-roots three ounces, of Butchers-broom two ounces, Chervil and Eringo *Apozems.* candied, of each one ounce, shavings of Hartshorn, Ivory, of each two drams, of burnt Hartshorn two drams and a half, Burdock-Seeds three drams, boyl them in three pound of Spring-water to two pound, in it strained hot, infuse the leaves of Clivers, Water-cresses, bruised, of each one handful, adding of Rhenish wine six ounces, make an infusion close and warm for two hours, after strain it again, and adde of Magistral-water of Earth-worms two ounces, Syrup of the five opening Roots an ounce and a half. Make an Apozeme, the dose four ounces twice a day, with some other medicine.

While these are taken inwardly, also Topicks and outward Applications may be carefully administred; not those which are hot and discussing, but those which are endowed with particles of a volatile Salt, and Nitrous, to wit, those which destroy the Combinations of other Salts, and dissolve the impactions of the Spirits, for which we propound the ensuing things. If Fomentations ought at all to be admitted into use, let them not be applied too hot, also let them be prepared not of those that are usually call'd Carminative, but chiefly of Salts and Minerals. *Topicks:* Cabrotius (cited by Helmont) says, That he cured one of 80 years of age, whose Belly he fomented twice a day with a Lye, in which he boyled Salt, Alum and Sulphur, and after applied Cow-dung for a Cataplasm. I use to prescribe these ensuing.

Take of flowers of Sal Armoniack one ounce, Crystal mineral two ounces, Spirit of A fomentation. Wine small and imbued with much Phlegme two pound, mixe and dissolve them in a glass.

Let a woollen Cloth dipt into this warm be applied upon the whole Abdomen, and then let it be changed, wetting it again; let it be done for the space of half an hour twice a day, afterwards let there be applied a Cataplasm of Cow-dung, with the powder of Dogs-turd, or the following Plaister.

Take Empl. Diasaponis, that is, de Minio, with Venice Soap, let it be spread thin A Plaister. upon limber Leather, and applied to the whole Belly, to be renewed once in ten or twelve dayes.

II. The second Indication requires mostly alterative Remedies, to wit, those which stop the fermentations of the humours in the bowels of the nether Belly, and the Orgasms and irregular excursions of the Spirits, also those which procure equal mixtions and due motions of the Chyle and nervous Juice: for which end Chalybeates are chiefly in use. And truly it is wont not only in this, but in many other splanchical Diseases, to have resort to the Medicines of Iron, as if from thence to fetch the sharpest weapons; whenas many Empiricks and Quacks, who prescribe these things confidently and dogmatically, observe not by what way such a Medicine doth operate, or what alterations for the better may be lawfully expected from thence: wherefore, while Iron, changed into Medicine, although the Sword of Goliath, is snatcht and brandisht by a blind man, it is no marvel if it prove in vain, or if in the stead of the disease, which is an Enemy, Nature it self is sometimes hurt; and truly frequently it happens so, when Chalybeats, of which there is great variety, and diversity of operations, are administred without any choice or difference either of the temperament or constitution in the Patient, and respect to the state of the Disease. *The second Indication.*

Of Medicines prepared of Iron or Steel, and of their vertues and manner of working, we have in another place treated, and there is no need here to repeat the same things. For this disease, if any of them, not all of them are fit; for those in which the frame of the mixture being opened, the Sulphur remains still, and being loosened predominates over the rest, they are altogether to be excluded from this number; for they do much ferment the Juices of the bowels with their notable fermentation, and do so exagitate the Blood and Spirits, that the whole Region of the nether Belly is lifted up into a greater bulk, as if by a certain Spirit thronging violently into it. *Of Chalybeate Medicines.*

Neither here are they fit, from which the sulphureous particles together with the saline are chased away, as in *Crocus Martis* prepared by long and strong Calcination. For this Medicine as it is conducing to stop all fluxes, rather fixes any impaction of Humours and Spirits, and renders them more obstinate. *What preparations of Iron are not convenient.*

R

But

What sort may
be admitted.

But there remains a Martial Remedy of a middle kind, wherein the Sulphur being wholly or for the most part expell'd, a vitriolic Salt remains and predominates: as indeed it is in the solution of the filings of Iron, or in a simple Infusion, or in Mineral water, in the Salt or Vitriol of *Mars*, in our preparation of Steel, with many others; out of which medicines, being prepared or compounded, we find by often Experience that in some cases, they contribute notable help. For these destroy the exotick ferments of the bowels, and restore the native ferments; they open their obstructions, they fix the blood, and restrain its confistence from too much dissolution; wherefore Chalybeate remedies, after the same manner as certain other alteratives, do perhaps something profit against the procatactick, and more remote causes of a Tympany; but as to the conjunct cause, they contribute little or no succour.

Forms of Cha-
lybeates.

Take of our Steel finely prepared two drams, the distilled water above prescribed two pound, Syrup of the five Roots two ounces, mix it in a glass, let it clarify by settling, the dose three or four ounces, in the morning, and at five afternoon.

Take of the Powder of Aron-roots, Crabs-eyes, of each three drams, Crystal Mineral two drams, Vitriol of Mars a dram and a half, Sugar of Rosemary-flowers two drams, mix them, the dose half a dram twice in a day with a convenient vehicle.

A liquor of the
flowers of Tap-
sus Barbatus.

Hartman doth wonderfully magnifie the liquor of the flowers of *Tapsus Barbatus* or Mullein, as a specifick remedy in this disease, by putting the fresh flowers into a Vessel, being strongly press'd, and put into an Oven with bread being close stopt, afterwards the Liquor being strained, let it be distill'd in *Balneo*, the dose one Scruple in the Decoction of Fennel-seeds and Roots. Surely this Medicine, if it doth effect any thing, ought to be given in a larger dose.

Johannes Anglus commends an Electuary of *Rosata Novella* with *Diatrion Santalon*, and Egges of *Ants*, which remedy seems to promise something probable enough. In imitation of this I here propound this ensuing.

An Electuary.

Take Conserve of Chichory flowers, of Indian Cresses, of each three drams, powder of Aron-roots, Lignum Aloes, yellow Sanders, of each one dram, Crabs-eyes one dram and a half, Salt of Wormwood one ounce, *Ants Egges* one ounce, the liquor of *Tapsus Barbatus* half a dram, with a sufficient quantity of Syrup of Citron-rinds make an Electuary, the dose two drams twice in a day, drinking after it of the former distilled water, or of the following Julep three ounces.

A Julep.

Take the water of the leaves of Aron, of the Juice of Elder-berries, of the water of Juniper and Elder-flowers, of each six ounces, the magistral water of Snails, and of Earth-worms, of each two ounces, Syrup of the Juice of Elder-berries two ounces, mix and make a Julep.

Third Indica-
tion.

III. The third Indication Vital prescribes Remedies against fainting of Spirits, and difficult breathing, and against Watching and Thirst. We will briefly annex certain forms of either kind.

1. Cardiacks.

Cordials.

Take of the water of Napha, Marygolds, Camomile, of each three ounces, of Dr. Stephan's water two ounces, Tincture of Saffron two drams, Sugar one ounce, Pearls one dram, make a Julep, the dose four or five spoonfuls three times a day or oftner in faintings.

Take Conserve of Marygolds two ounces, Confection of Alchermes, and de Hyacintho, of each two drams, prepared Pearl one ounce, Syrup of the juice of Citrons, enough to make a Confection, take the quantity of a Nutmeg evening and morning, drinking after it a draught of the Julep.

2. Hypnoticks.

Hypnoticks.

Take of Aqua Hysterica six drams, Syrup de Meconio half an ounce, mix them, and take late at night. Or,

Take of small Cinnamon-water one ounce, Diacodium three ounces, Tincture of Saffron two drams. Mix them, and take one spoonfull at night, if sleep be wanting. Or,

Take

Take Syrup of Cowslip-flowers three spoonfuls, compound Pæony-water one spoonful, Ladanum tartarized one dram, take one spoonful, if Watchings require it.

3. Extinguishers of Thirst, in this Disease being very thirsty, ought frequently *Things mitigate* and in small quantities to be administred, that that troublesome symptom may be *ting Thirst* restrained without much drink, which is perpetually pernicious. For which purpose,

Take of Conserve of Wood-sorrel passed through a Sieve three ounces, Pulp of Tamarinds two ounces, Sal Prunella one dram, with a sufficient quantity of Syrup of the juice of Wood-sorrel, make a Lohoch, of which let him lick often.

SECT. II. CHAP. V.

Of an Anasarca.

NOW two kinds of Dropsies, viz. Ascites and Tympanie (according to common reckoning) being finisht, although the third, to wit an *Anasarca* (for that it is an affection rather of the whole body, than of the nether Belly) appertains not properly to this place, notwithstanding the Pathologie thereof having some affiance with the former, we think fit to deliver here also its Cure in short. An *The description of an Anasarca* Anasarca is described after this manner, *That it is a white soft Tumour of the whole outward Body, or of some of its parts, yielding to the touch, and leaving a dent upon compression,* proceeding from a watery humour extravasated, and accumulated as well within the interspaces of the Muscles, as within the pores of the flesh and skin, yea of the Glandules and Membranes.

It differs from an Ascites as to its outward form and appearance, yet not as to *How it differs from an Ascites* its morbid matter, which being the same in both distempers, as it is heaped within the greater or lesser hollownesses, it gains divers Appellations of the Disease.

The watery humour procuring an Anasarca, doth proceed altogether or for the most part from the blood; for it being continually produced within the mass of blood *The Original from the blood* by the fault and defect of sanguification, it is poured out in greater abundance from the extremities of the Arteries, than can be received, or brought back by the Veins, or the Lymphaducts, or can be discharged by the Reins or pores of the skin, and other vents of the serous Juice.

From these it follows, that the material cause of this Disease is a watery humour, *The material and efficient cause* and the efficient is blood, which engenders waters and deposits them in the places affected. We will exactly weigh the reasons of either of them, and the manner of becoming and effecting it, and first we will treat of the efficient Cause of an Anasarca.

1. The affection of the Blood, or rather the Hydropical brood, consists in these *The Blood its efficient cause in a double respect* two things, to wit, First by reason of a failure or fault of sanguification, it doth not rightly assimilate the nutritious Juice perpetually infused into its mass, but suffers it to degenerate into a watery humour: Then secondly by reason of the too loose mixture thereof, it doth not retain that humour, so degenerated, so long within its consistence, untill it might be discharg'd through fit Emunctories or Emisseries, but lets it out every where near to the ends of the Arteries, into the inter-spaces of the Vessels, and there leaves it. Either of these vices of the Blood we will consider a little more.

In the first place as to the former, for the most part it is confessed by all, that the Blood it self and not the Heart or Liver sanguifies, by what of late is plainly understood *First that it doth not rightly sanguifie* concerning the functions of these parts; yet by what means the Blood assimilates Chyle infused to it self, and converts it into fresh blood, to be bestowed to so many and diverse sorts of uses, doth not easily lie manifest to us. But what some affirm, that it is made only by the exact comminution and commixtion of particles, and for that cause the particles of either kinde being confused together, they think, that within the

*The reason
whereof enquir-
ed into.*

It is rather passages of the Liver and Lungs they are kneaded and wrought together as it were with little pebbles, seems little probable to me; but on the contrary, I think these bowels (as I have shewed already) are constituted the Organs rather of separation than of mixture; but the reason of sanguification altogether consists in this, that the active particles of the old blood, to wit, the saline and sulphureous, being placed in vigour with the spirituous, immediately act upon the like particles of the infused Chyle as yet existing in an inferior state, and do so stir them up and ferment them, that thereupon being extricated from the coverings of the thicker parts, they are carried into a like degree of exaltation or perfection with the former, and being at length associated with them, and made also homogeneous, they put on the same nature of Blood; the more thick and heterogeneous particles being removed thence to another place, from those which they had deserted and gone away from. For truly Sanguification is altogether finished by Fermentation, even as the maturation of the Must into Wine or Ale; but the reason of the difference is, that Wine being shut up in the Tub, still remaining entirely in the same Mass, is slowly fermented, as to its whole consistence, and is not accomplished but in a long space of time; but the Blood constituted in a perpetual flux by the loss of some parts and the reparation of others, is fermented by the parts still received fresh, and is generated anew.

*The reason and
manner of san-
guification ex-
plained.*

The old Blood for the most part affords the same thing towards the fresh Chyle, as Ferment from the flower or faces of old Ale, being put into new Ale; notwithstanding as it were by a contrary manner; because the huge mass of blood being formerly fermented, doth suddenly ferment and alter the small portions of the Chyle continually brought in; but the fermenting liquor in Ale in a very little quantity is put to the great mass of the other liquor to be fermented; which it brings not to maturity under a long space of time. After the rudiments of blood are so cast by fermentation, the conclusion and perfect assimilation into blood, is acquired by accension; (for surely that it is so enkindled (as I think) I have formerly shewed by demonstration, which arguments chiefly taken from its proper passion, although many have cavil'd at, none have been yet able to overthrow.) Wherefore, while the whole mass of blood consists of Blood and Chyle confusedly mixt together, it is fermented while it is circulating; and being divided into most minute portions, is spread through the whole Lungs, that it might be kindled successively according to all its parts, by the nitrous air sucked in: for by that means both the vital flame is continued, and all the particles of Blood having as it were passed the fire, become more purified, and more agreeable among themselves; moreover, they are so disposed of whilest they are kindling, that while some go into Nourishment of the Spirits, of the Nervous Juice and the solid parts, and others less useful depart into the ferments or recrements of the bowels; mean while others being more fixt, abide longer in the mass of blood, and sustain its consistence, and by fermenting the Nutritious Juice, still engender new Blood, untill themselves being impoverished, are at length discarded, and give place to others that are fresh and lustie.

*An Hydropick
temper of the
blood springs
from a double
respect.*

Having shewed after this manner by what course Sanguification ought to be finished, as well by fermentation as accension of the Blood; it will be easie to conceive wherein the fault consists producing an Hydropick disposition: To wit, this usually assumes its rise whensoever either or both those Conditions requisite to Sanguification, either fail, or are perverted.

*Viz. First from
the defect or
fault of its Fer-
mentation;*

First therefore this happens more frequently and rather, for that the blood being depraved in its temperature, doth not rightly ferment the Nutritious Juice poured into it, that so it might be changed into laudable blood. For when the watery particles predominate with the earthy in the mass of Blood, the Salt and Sulphur being depressed with the Spirit, as all the functions, both Vital and Animal, from thence languish and waver; so especially Sanguification it self fails and is perverted. For the Juice of the Chyle commixt with the Blood, when it cannot be dissolved and fermented, with the particles thereof, (after the fashion of other liquors, as often as being mixt they want ferment,) it degenerates perhaps into a watery, acid, or ropy, or otherwise faulty humour, which being afterwards daily encreased, and at length rising to its fulness, lyes heavy on the blood, and oft-times almost stifles its heat; from whence there is a necessity that it be forthwith discharged by some means, and wheresoever it can get vent; but afterwards for that the offices of separation fail in their functions (the stock of the animal Spirits languishing by reason of the diminished provision from the influx of Blood,) the abounding Serum is deposited every

every where into the pores, and next vacuities whether greater or lesser, out of the little mouths of the Arteries; from whose daily and great encrease, after all the pores are filled, arises that as it were fenny habit call'd *Anasarca* of the whole body outwardly, or of some of its members.

Secondly, not only the defect or fault of Fermentation, but also of the accension of the Blood, induces sometimes an Hydropical disposition on the mass thereof: which is clearly discern'd, inasmuch as some persons inhabiting Maritime or moorish places, fall into the Dropsie without any other cause or occasion, than that they draw a thicker air endowed with heterogeneous vapours, by which the Nitre is either driven away or obscured. Therefore the blood becoming degenerate, and vitiated as to its temperature, because it is not duely kindled, nor perfected by efflagration within the Precordia, doth not rightly dissolve and assimilate the Juice of the Chyle, but suffers it to be perverted into a watery liquor. But although in the first place, the blood being depraved for this reason, sometimes loses its fermenting vertue, and therefore the rather and more immediately procures a Dropsie; notwithstanding it is manifest, the first fault thereof assumes its origine from unwholsom air suckt in, and not duely enkindling the Blood; because such Hydropicks removing their residence into Sunny and Mountainous places, recover their health without any other Medicines.

Hitherto of the nearest Causes of an Anasarca and which are conjoyned to the Disease it self, which namely are the depravation or defect of the mass of blood, chiefly as to its fermentation, and in some measure as to the enkindling thereof; which latter is scarce wont to be effective but when it follows the former: But what remains as to the more remote and procuring causes of this Disease, to wit, from which the defermentative affection arises (that I may say no more of the defect or depravation of its enkindling;) I say that these appear so diverse and many, that I judge it hardly possible to recite them all particularly; notwithstanding, very many or at least the chief may be reduced to these three heads: to wit, For that the watery distemperament of the blood doth arise, inasmuch as its active Principles, viz. Spirit, Salt and Sulphur, are not invested with their fermenting and sanguifying force or vertue, I account this to come to pass, either First because those particles are too much wasted by their great expences; or Secondly because they are not repaired by convenient and proportionate Refections; or Thirdly, for that they are overwhelmed or obscured by some other duller or heterogeneous Particles being too much accumulated in the mass of Blood: We will a little weigh the Reasons and ways of each of these their coming to passe.

In the first place, the former of these is evidently discerned in frequent and inordinate Hæmorrhages, whereby many men, although strong and formerly healthy, are immediately enclined to a Dropsie, more than from any other accident or occasion; the reason whereof is, that the blood is so impoverished, through its more noble Particles issuing out in great abundance, that afterwards it can neither duely ferment nor enkindle the Juice of the Chyle brought into it. Moreover, sometimes the same effect succeeds (although in a more slow degree) from Feavers and other long maladies and languishings; to wit, inasmuch as the blood suffering under a long depression, is so extenuated and robb'd, that at length it becomes watery and defermentative.

Secondly, the Blood sometimes deserting its genuine disposition, declines into an Hydropical one, for that the nourishment being more slender than it was wont, or ought to be bestowed upon it, its active and sanguifying Particles are not enough repaired within its masse; for so we have observed, that some who have used themselves to Wine and stronger Drink, after they have been reduced to homely Diet, and smaller drink, of water or small beer, suddenly have become Hydropick. It is a common observation, and frequently true, although of ill omen, that Drunkards, and daily drinkers, if that wild Custom be left, at length becoming sober and abstemious, are much in hazard, left by reason of the usual fermentation of the blood being depressed, they become obnoxious unto that Disease. I knew a notable Drunkard, who declared that a Priest very learned and Pious was guilty of his death, because he gave him admonition to Temperance, and to leave his Drunkenness, and he complying therewith, incontinently fell into a mortal Dropsie.

But the third cause or occasion disposing to that Disease, the most common and notable, consists in this, that the active Particles of the Blood, being involved with other

Secondly, from defect of Accension.

Reduced to three heads.

First, because the active particles of the blood, are too much consumed.

Secondly, because they are not enough repaired.

Thirdly, because they are buried in duller particles.

*Whereof there
are three causes.*

*First from Non-
naturals immoderately ingested.*

*Secondly, From
Naturals unduly retained.*

*Thirdly, From
Preternaturals
generated in the
Body.*

*Different manners
hereof are
reckoned.*

*The material
cause of an Anasarca
is partly the Serum of the
Blood, and partly the nutritious
Juice.*

other more dull or heterogeneous ones, or being dissipated from one the other, lose their fermentative power, or cannot enough exercise it. But such an affection of them, as it is wont to be raised from various causes and accidents, so chiefly from these, three, one while solitary, another while united together; to wit, First from the Non-naturals immoderately received: Secondly from the Naturals unduly retain'd; or Thirdly, from the Preternaturals corruptly generated in the body.

The errors of Diet deservedly may be referred to the first rank of these (whereby the stock of that Disease is always most abundant) For it is a common Prognostick and in every bodies mouth, that Gluttons and great Drunkards dye at length of a Dropsie: to which moreover, not only Surfeits and immoderate and daily Tiplings incline, but also frequent and unseasonable Treats; and moreover the continual pouring in of absurd and hard to be digested Nourishment. For from the evil course of Diet of each kind used any while, whereas the Juice of the Chyle, oftentimes crude, incongruous, and above measure plentiful, is poured into the masse of blood, it of necessity follows, that it is first burdened, and afterwards its Consistence being loosened, the more noble Particles being forced asunder, it is so involved, or abated by the other heterogeneous ones, that being hindred, it desists from its fermentative or sanguifying virtue; inasmuch that the bowels being in a short time hurt by its assaults, a Cachexia, and then a Dropsie followes, whereof that is alwayes a forerunner.

Secondly, in this place are put all ordinary, accustomed and solemn Evacuations suppressed. It is observable enough, that a Cachexie, and often a Dropsie, doth arise from a menstruous or Hemorrhoidal flux diminished or stopt, no less than from a too immoderate one, (by reason of the fermentation of blood impeded by the heterogeneity of Particles.) Moreover, the same is often wont to be effected from Issues suddenly stopt, or eruptions of the Skin suddenly repercuss'd. Lastly, suppression of Urine, and sweating much hindred, do render the blood more watery, by an immediate and necessary affection, and incline to the Dropsie. Also it is an observation frequent enough of healthful Persons, who being compelled for some time to abstain from going to Bed, that their feet have swoln.

Thirdly, Preternatural things generated within the Body, but especially Tumours and Humours do hinder the motion of the blood, or pervert its temper, and so induce an Hydropical disposition. Tumours stirred up in some place about the Bowels, inasmuch as they hinder or straiten the circuit of the Blood, do cause its Serum to be there extravasated, and poured out; by the accumulation whereof within some cavity, in the first place an Ascites (as we have shewn above) and at length an Anasarca a consequent of that doth frequently ensue. Moreover, Humours of divers sorts being engendred in divers places within, and transferred into the blood, do first pollute the masse thereof, and defile it with heterogeneous Particles, whereby at length it is so depraved in its temperament, that it perverts the Juice of the Chyle brought in (when it cannot further ferment and assimilate it) into an hydropical liquor. For this reason, nothing is more usual than that Consumptive persons, and those that are affected with strumous and cancrus Ulcers, nay of any sort within the Reins, Mesentery, Guts, or other Bowels of the lower Belly, after they have been long consuming, dye at length hydropical.

Hitherto concerning the next efficient cause of this Disease, also of the chief remote ones, as well procuring, as evident. But as to what appertains to the material cause, it is obvious unto the Sense, that it is a meer Lympha accumulated within the pores of the Skin, and of the other outward parts; which being deposited there by the blood (the liquor thereof being partly serous, and partly chylous Juice) but failing in Sanguification and Nourishment of the body, to which it was destinated, it is cast off like recrements into the vacuous spaces of every vessel. And though the matter of the Dropsie proceed from the Blood and Chyle, yet it is no wonder if it appear neither like blood, nor milkie, but only limpid; because the Urine even of healthful people, after more plentiful drinking, is rendered crude as well as watery; and therefore it is manifest, it is nothing changed by the blood, but leaves in that place, whatsoever of colour or thicker consistence it brings to its masse. And although a reason may be given in either case, that the Urine, inasmuch as it is streined through the Kidneys, and the hydropic matter thorough the pores of the solid parts, even so become limpid and watery; notwithstanding it is evident by observation, that the watery part of the Chyle, even while it is confounded with the blood, is not intimately mixt with it, but being deprived of its colour and consistency, it remains under the

the form of Lympha, within the pores of the blood; the sure sign of which is, that the blood taken from any Animal by Phlebotomy, after being cold it is divided into parts, exhibits a watery liquor (which consists of Serum and Nutritious Juice) plainly limpid, and separate from the other blood. It will be from our present purpose to enquire any further into the reasons hereof, and manner of being so, and wherefore blood, which being poured into water doth presently tinge the same, and bloodies all solid bodies whensoever it is sprinkled thereon, yet dyes the Serum of no colour with which it is intimately confounded and a long time circulated.

Why the hydropick humour is limpid and not milkie nor bloody.

From the Ætiologie of this disease now delivered, the differences of it may easily be collected; to wit, first it is either universal, when the whole habit of the body and all the members swell up; or it is particular, wherein for the most part the inferior members only suffer, in the mean time the rest of the body pining away for want of Nourishment, which kind of distemper, and not a Tympanie, *Prosper Martianus* will have *Hippocrates* style the dry Dropsie, in which what is reported of the Syren, the dry is joyned to the watery.

The Differences of the Disease.

Secondly, an Anasarca whether universal or particular, is either simple or complicated with an Ascites; and then either an Anasarca ensues an Ascites, or this disease follows that. Moreover an Anasarca may be distinguished many ways in respect as well of the procatactick as evident causes, as we have before intimated; and such differences thereof are found to be frequently of great moment about duely instituting the Prognostick and Cure.

Wherefore, what relates to the prognostick part, this disease while it is simple, proves least dangerous among all the kinds of Dropsies; and a particular one seising only the inferior members, so that the belly doth not together swell with them, is much safer than an universal one.

The Prognosticks of it.

An Anasarca bringing on an Ascites, wherein for the most part the Urine is plentiful enough, and the thirst not very intense, is far more safe than an Anasarca brought in by an Ascites, wherein the diseased do very much thirst, and make little, red, and thick, and for the most part a lixivial Urine. In like manner it is, or worse, when an Anasarca comes upon a Tympanie or a Phthisis (as sometimes 'tis wont.) Lastly, no slight Prognostick of this disease is taken from the compliance, or the obstinateness of the Patient, about Diet and Medicine. For whatsoever the condition of the disease may be, if the hydropick person refusing medicine will indulge his fancy, we may not hope any good from thence.

About the Curatory part to be designed in order, two chief Scopes of Healing do occur, viz. First, that the water between the skin be consumed by some means; Secondly, then provision must be made, lest it be continually generated and accumulated afresh; for which purpose a Physitian is to employ his labour, both that the bowels of Concoction being emptied of their Superfluities, and free from obstructions, may always procure laudable Chyle, and supply the masse of blood in due plenty; as also that the blood (the principles thereof being restored to its fermentative power) may orderly ferment the Juice of the Chyle continually poured into it, and assimilate it into Blood. The vital Indication seems not at all necessary in this disease as in many others, for that very rarely in this appear swoonings of the Spirits, or Watchings, for which Cordials and Hypnoticks are required; and there is little need of restoring Diets, because Fasting and Abstinence rather help, and oft-times make up the greatest part of the Cure: the reason whereof is, that the Vessels being emptied through want, do swallow up the waters between the skin, or stagnating in other places, and do discharge them forth partly by the Kidnies, by the pores of the skin and other Emunctories, and partly do advantageously employ them being yet turgid with alimentary Juice, to the nourishing of the body.

The Cure of it. Two Indications.

First, That the first Indication being Curatory, intending an Evacuation of the morbid matter, may be performed, there ought to be exhibited all Hydragogue medicins, as well simple as compound; and also the forms of medicines recounted and prescribed in the former Chapter of an Ascites. Moreover, hereto belong not only Catharticks and Diureticks, but also Diaphoreticks, which though in other sorts of Dropsies they are very much forbidden, often take place in curing of an Anasarca.

The first intends the evacuation of the morbid matter.

In a simple Anasarca we may lawfully administer strong Purgers, and frequently they much profit. And truly this Disease being cured sometimes by means of a Cathartick, Empiricks do much glory of their Cures, and certain of their medicines become much cryed up for curing hydropical persons; for if at any time it happens

By Purgers

that

Strong Purgers
are convenient
but not to all.

that they have healed one or two labouring with an Anasarca, by their specifick Hydragogues and Elateriums, it is enough wherewith they may always magnifie themselves and their Art, although by the same medicine they have murdered a hundred Ascitical persons. Wherefore, although Preparations of Spurge, or *Elaterium*, *Pilule Lunares*, *Hercules Bovii*, and other Hydragogues, have sometimes profited in some cases; notwithstanding if they be indifferently exhibited to all Hydropicks, or at all to any endowed with a weak Constitution, and Bowels of a brittle tone, or of evil conformation, they oftener cause death than remedy: wherefore let it always be committed to the judgment of a prudent Physitian, the time when, how long, and what sort of Catharticks are to be used.

We have before described forms of Hydragogue Purgers of every sort, to wit, those that exercise their power upwards and downwards, and as well mild as stronger workers, so that they may be referred hither, and accommodated to the method of healing now proposed.

The manner of
their working.

But if the reason be enquired, after what manner Purgers do operate in this disease, and why they more happily, and much more efficaciously bring out waters than in any other sorts of Dropsie; I say, in an Anasarca the morbid matter (which is the Lympha) subsists partly in the mass of blood, partly in the habit of the body, within the pores and vacuities between the ends of the vessels; wherefore, a strong Cathartick being administered, presently troubles and dissolves the mass of blood, and stirres it up to the excretion of any superfluous or heterogeneous thing; and irritates also the little mouths of the Arteries gaping towards the Cavities of the Intestines, that the humour ejected from the blood may easier find vent through these Emunctories. From hence in the first place, the waters fluctuating within the blood are abundantly drained out, afterwards the vessels being emptied, do presently swallow up again the waters between the skin, and presently discharge them forth partly by siege, and partly by Urine, or Sweat; in the mean time there is no fear left, as in an Ascites, the morbid matter being driven and poured from the blood, by the Medicine, should be further forced into the places affected, whence not easily flowing back again, it should be more largely encreased; nor left, as in a Tympany, by reason of the Fibres of the Stomach and Guts being too much irritated by the Physick, those bowels might be provok'd into convulsive swellings. For as long as the bowels are firm and well constituted, the particles of the Medicine inflict them with no hurt; but presently being brought into the blood, they do not only allure waters out of it, but by exagitating the mass thereof, they raise the active particles formerly overwhelmed, and dispose them towards their fermentative power.

Secondly, By
Diureticks.

And chiefly
Lixivials.

Secondly, Hydragogues working by Urine, as well simple as the compound, as also forms of Medicines prepared from either of them, and the manner of their administration, we have also described above, which also may be transferr'd hither to save repetition. But because not all Remedies of this kind do help alike in all the Distempers, it is here observable, that for curing an Anasarca *Lixivials* (as has been frequently manifest by our observation) do far excell other Diureticks. For indeed now it is a common and thredbare Remedy, for any one having swell'd members, after a previous Purge, to take twice or thrice in the day, from six to eight ounces of a Lye made of the Ashes of Wormwood or Broom, made in White-wine, and to continue the use of it for some dayes. This Medicine moves potently the Urine as I have observed in many, yea sometimes in such abundance, that pissing the quantity of half a gallon in a day and a night, the Patients have recovered their healths in a short time even to a miracle.

The reason and
manner of their
operation en-
quired into.

We have unfolded in a former Treatise, by what manner and fashion Diureticks of several kinds do operate, and after what manner they affect the bowels, blood and other humours: But that in those that labour under an Anasarca, Medicines endowed with a fixt and lixivial Salt, expell Urine more than those of an acid, alcali, or volatile Salt, the reason as I judge is this, *viz.* in those affected with this disease, after the fermentation and sanguifying vertue of the blood failing, the watery and crude humours heaped up as well in its mass as in the habit of the body, do there remain almost immovable for a long time, till at last they (as the manner is of watery Juices long stagnating) do wax soure; wherefore the lixivial particles of the Medicine spread abroad in the blood presently boyl up with the acids of the waters, which while they ferment and move, they stirre up in the whole mass of Blood, a notable and excretive fermentation; inso much that all the particles being put into motion,

not

not only the watery and superfluous being thrust from the rest, are discharged by the Reins; but also the innate and active particles of the blood it self, unfold themselves from the more gross with which they were involved, and lastly rising up, they begin to resume their fermenting power, and to sanguifie.

Take of the Ashes of Broom or Wormwood, or of the twigs of a Vine calcined to whiteness and sifted, four ounces, put them into a glass bottle with a quart of White-wine, let them digest close stopp'd and warm for three or four hours, after strain it; the dose from six to eight ounces twice a day. Forms of lixivial Diureticks.

Take of white Tartar calcined with Nitre, and after melted in a Crucible to blueness three ounces, small Spirit of Wine a pound and a half, water of Snails and Earth-worms, of each four ounces, digest them in a Sand furnace for two days: the dose of the clear liquor from two to three ounces, with four ounces of the decoction of Kneeholm and Burdock-roots in Ale.

For ordinary Drink:

Take of the white Ashes of Broom cleansed two pound, put them into a little Bag, with three ounces of Sassafras, one ounce of lesser Galangal, an ounce and a half of Juniper-berries, and as much of Carrot-seeds, make a bag for four gallons of Ale, after seven or eight dayes begin to draw it.

3. *Diaphoretick*; do often very notably help in a Leucophlegmatia (which is the commencing or declination of an Anasarca) but in this disease confirmed, they are wont to be more convenient than in other kinds of Dropsies. And although from the beginning they cannot cause Sweats, by reason of the habit of body surrounded as it were with a more thick marsh, however while they exagitate the blood, they cause the innate active particles thereof, being before dormant, and half overwhelmed, to be raised up and disposed towards fermentation, and also they cause all the excrementitious, and chiefly the watery, to be raised into motion, so that presently flowing out of their Receptacles, they may the more readily and easily find way by siege or Urine, and oftentimes in some part by transpiration. But truly after the waters being poured out by purgation, the morbid matter is diminished so much; that the bulk of the body and the swelling of the members begin to abate, the reliques of the humour are best consumed by a moderate transpiration and constant sweating.

We have described before the number and forms of Hydroticks; as to the present purpose for curing an Anasarca, those chiefly are fit which are given in a larger dose; for they whose quantity is very small, their active particles being overwhelmed in the waters, are lost before being infused into the blood they can exert their strength. Wherefore, Spirits, whether armoniack or vinous, as also Tinctures and Elixirs, yea and powders, are more rarely used in this disease, because they effect little in a lesser dose, and if they be exhibited in a very large one, they often hurt the bowels by their outrage; But those things are rather chosen, which being taken hot, and in a full draught, are able to pass into the whole blood not weakened; of which sort, in the first place are Decoctions of Woods, and Roots, whose particles being agreeable enough to the Blood, and not to be tamed thereby, do pass through the whole mass thereof, and do exert their Elastic power by moving together all the humours.

Take of the Shavings of Lignum Vita six ounces, Sassafras two ounces, of each of the Sanders six dram, shavings of Ivory, Harts horn, of each three drams, let them be infused and boyled in eight pound of Spring-water to half; adding of Calamus Aromaticus, lesser Galangal, Burdock and Butter-Bur-roots, of each one ounce, the leaves of Sage, Germander, dried, of each two handfuls, let the strained liquor be kept for use; the dose from eight to ten ounces twice in a day warm; to every dose may be added 20 or 25 drops of Spirit of Sal Armoniack drawn with Amber, or of Spirit of Soot, or half a dram, or a dram, of Tincture of Salt of Tartar. Forms thereof.

Hitherto of inward Hydragogue Medicines, which cause the Lympha to be drawn forth, either by alluring it inwards towards the guts, or by driving it forth to the Reins or pores of the skin. Besides, there are certain outward administrations in use, by which the water accumulated within the habit of the body are moved together,

External Hydragogs.

*The chief Kinds
of them, and the
manner of their
Administration.*

ther, and so are either generally disposed to go forth by sweating, or Urine, or particularly are sent out forthwith, a vent being made in some private places.

In the first rank are placed Frictions, Liniments, Fomentations and Baths as well dry as moist: Then those particular things that bring out waters are, Vesicatories, and things that bring the Skin to an Eschar, and prickings by a Needle. We will treat briefly on each of these, or at least of the principal of them, as far as they have reference to this disease.

1. *Frictions.*

1. Frictions do frequently afford advantagious success in a Leucophlegmatia and an Anasarca: for when the habit of the body is not only filled with a watery illuvies gathered there together, so that nothing can evaporate, but that the extern parts grow cold by reason of the approach of blood towards them being stopt, often and strong frictions do move together the stagnating waters, and dissipate them from thence in some measure, and also recall again the blood by opening the passages into those parts from whence it was banished; wherefore, not only the swollen members, but also the whole body once or twice in a day, is expedient to be rubbed with a coarse Cloth, or with a little Brush now ordinarily prepared for that purpose.

2. *Liniments,
and,
3. Fomentations.*

2. 3. With or after Frictions, Liniments and Fomentations are sometimes convenient. They are prepared either of Salts, and other Minerals dissolv'd, or from hot and discussing Vegetables, with the faeces of Wine boyld in water, the hot application whereof opens the pores, moves together more amply the accumulated waters, and discusses them, and also enlarges the compass of the bloody Circuit, the watery heap being somewhat dissipated. Let the Liniments consist of Sulphur, and Salts of a diverse kind, or of Quick-lime, and other Minerals, which being powdered and mixed with the mucilaginous Extracts of sharp Herbs, are reduced into the form of an Unguent; to which let a fit quantity of Oyl of Scorpions be added, for the better consistency. Moreover this Oyl (so it be genuine) applied by it self, doth frequently afford notable help. I knew a Boy much swell'd with an universal Anasarca, who was cured by this Remedy alone: for his mother (I know not by whose advice) anointed his whole body morning and evening with Oyl of Scorpions, strongly rubbing all the parts with her hot hand; by which act within three dayes he began to pour forth abundance of Urine, and when he had continued pissing so for some dayes, the swelling vanishing by little and little, he became sound.

4. *Baths.*

4. Baths are not convenient in any Dropsie but an Anasarca, and not for this unless in a Diathesis or Declination. For seeing the Blood from the heat thereof, encompassing the whole Body, being made boiling and stirr'd up, every where puts in motion the waters formerly stagnating, and swallowing them up into it self, conveys them variously away; the danger is, lest (as frequently it falls out) receiving them out of the habit of the body into its own mass, it should depose them presently into the Præcordia or the Brain: for there is nothing more usual than an affection of those parts, viz. an Asthma or Apoplexie to come upon Hydropicks by unseasonable bathing. But when the conjunct cause of the disease (viz. a Swelling) becomes moderate, or not much, a Bath of water impregnated with Salts and Sulphur, or a Hot-house, by which a gentle Sweat is promoted, is frequently administered with success: As for the Stew it is more expedient, and oft-times notably helps, that the Patients be placed in fitting Seats in Salt-houses, near the Furnaces wherein Mineral Waters are boyled into Salt.

5. *Vesicatories.*

5. Vesicatories send out abundantly the waters between the skin, and often too profusely. Touching the manner how they operate we will treat more specially hereafter; in the meantime we advise, that they are very cautiously to be exhibited to Hydropicks, for that Epispasticks of this kind, applied to the swell'd places, do make the Emissarie too open, by which aperture the water in the first place bursting out, draws oftentimes a great illuvies after it from the neighbouring parts, whence immediately ensues a great prostration of the Spirits. Moreover, sometimes the place is so suddenly emptied, that being destitute of heat and spirits, it is in a short time sphacelated or mortified; wherefore this Medicine is seldom applied to the Legs, or the Feet of Hydropical persons, where the heat is weak, and the humour greatest, but sometimes to the Thighs and Arms with security (as often as there shall be need.)

6. *Escharoticks.*

6. *Escharoticks* are administered a little safer than Vesicatories, to the swell'd places, because from this Emissary the flux of waters happens not so headlong and abundant at first: but commencing moderately grows up by little and little to a great stream,

stream, which Nature (after that by degrees it is accustomed thereunto) endures the better. Moreover, there is less fear of a Gangrene from an Escharotick than from a Vesicatory, because in that application the part, whose union is dissolved, is defended by the Eschar against the loss of heat. I have known sometimes an illiterate and rude Empirick, who frequently by an Escharotick did evacuate with success the members of hydropick persons, however swell'd, by the ensuing manner: to wit, he fomented the legs evening and morning with the Decoction of Dwarf-Elder, Wormwood, Cammomile and other hot herbs put into the Lees of Ale or Wine; and between the times of the Fomentations he applyed a Cataplasim prepared of the masse of that Decoction with Bran; after he had used these for three dayes, he covered both legs and feet with a Plaister of *Burgundy Pitch*, leaving only a small hole on each Calf, about the bigness of a Nut, in which places he put an Escharotick, on the bare skin, of the Alhes of Ashen-bark: which after twelve hours being removed, a small Eschar was left, from whose pores water was wont at first slowly to sweat out, afterwards day by day a little more plentifully to drop out, and afterwards (the Eschar falling off) it used to flow out more abundantly as from an open Spring untill it had drein'd the whole leg both beneath and above.

*The empirical
manner of Es-
charoticks.*

7. There remains another manner (not inferior though less used than the former) of draining out the waters between the skin, viz. by the pricking of a Needle; which likewise ought cautiously, and minutely to be used, lest a headlong and too great efflux of waters be provok'd thereby. Take an ordinary Needle (such as Taylors use) and let it be thrust into the skin, pricking over the place chiefly swelled, only so far that blood follow not: and so at one time let six or seven little holes be made, a thumbs breadth distant from each other; from every little hole the water will issue forth by drops, and so it will continually drop out untill all the swelling vanish about the place so pricked; afterwards, the next time after twelve hours, another while after 18 or 24 hours, let the same pricking be exercised in another part of the same thigh, or of the other; and afterwards once or twice a day in this or that member, or in both together, or in more places, let such Emisseries of the water between the skin be excited. For in truth after this manner the hydropick illuvies may be exhausted more plentifully and safely than from any other outward Chirurgery; In the mean time if the new provision thereof be provided against by inward Physick, the disease will be the easier cured. Moreover in a desperate Dropsie life is best prolonged by such an administration, for that the waters being exhausted continually by those outward Emisseries, the inner inundation of life is longer protracted. Not long since an old man aged seventy years, overwhelmed with a Dropsie over his whole body, by the help of this Remedy only, remained living for many moneths beyond expectation, and raised his head above the waters.

*7. Pricking
with a Needle.*

Hitherto of the Kinds and Forms of Remedies suggested by the first Indication, viz. the Curative; what belongs to the other, to wit the Preservatory, which respects the temperature and sanguifying power of the Blood to be restored, it offers Medicines of that sort which being endowed with more hot and Elastick particles, revive the active or depressed Principles of the mass of blood, or cause those consumed to be repaired, for which end Remedies commonly called Altering are wont to be prescribed under the form of an Electuary, Powder, Pills, distilled Water, Julep, Apozeme and Diet, to which also Spirits, Tinctures, Elixirs, are sometimes added, for the better efficacy. We will propound one or two Examples of each of these.

*The second In-
dication pre-
servatory what
kind of Rem-
edies it suggests.*

Forms of them.

1. Take of Conserve of Roman Wormwood, Scurvy-grass, the yellow Rindes of Oranges, of each two ounces, Winters-bark two drams, Species Diacurcume a dram and a half, of Steel prepared with Sulphur three drams, Syrup of Citron-peels what suffices to make an Electuary, the dose two drams morning and evening, drinking after a draught of the Julep, or three or four ounces of the distilled water.

1. Electuary.

Chalybeate Medicines notably help in this Disease, as in the green sickness of Virgins, infomuch that frequently the whole or chief scope of curing depends upon this kind of Remedy; yet we are to observe, that not all Medicines of this kind are equally convenient in these cases: for those which are chiefly in use, viz. Salt of Steel, or *Vitriol of Mars*, and others prepared with acids, and deprived totally of Sulphur, do not help, inasmuch as they do not promote the fermentation of the blood, but rather on the contrary fix it, being too wild or elastick. But for an Anasarca or any

*Chalybeates
profit much in
this Disease.*

*But only those
endued with
Sulphur.*

watery tumours, in a cachectick habit of the body, Chalybeates of that sort are given, wherein the sulphureous particles are left, and are predominant; as in the first place the Filings of Iron, and the Scales, reduced into a fine Powder, also Steel dissolved with Sulphur, and powdered. The powders of this being taken, are presently dissolved by the acid Salts within our body, whence the sulphureous metallick particles being set free, and brought into the blood, they ferment the whole mass thereof, and revive the like particles in the same, which before lay dormant, and being conjoynd therewith, they give vigour to the blood, and renew its sanguifying power being formerly depressed. Wherefore we may observe by using but a little Chalybeates of this sort, the green and yellow colour of the face is converted into a florid.

2. Powders.

2. Take of the compound Powder of Aron-roots, of Winters bark, of each three drams, lesser Galangals, Cubebs, of each a dram and a half, of Steel prepared with Sulphur half an ounce, Sugar of Rosemary flowers six drams, make a Powder, divide it into twenty parts. One part is the dose, morning and evening, with a draught of the sudoriferous Decoction before prescribed.

3. Pills.

3. Take half an ounce of the gummos Extract residing after the distillation of the Elixir Vita of Quercetane, powder of Earth worms two drams, lesser Galangal, Winters-bark, of each one dram and a half, Salt of Wormwood two drams, of Rust of Iron two drams and a half, Balsam of Peru one dram, Tincture of Salt of Tartar two drams, Balsamum Capivi what suffices to make a mass to be formed into small Pills, the dose half a dram evening and morning, drinking after it three ounces of the Julep or the distilled water following.

4. Julep.

4. Take of the water of Elder-flowers, of the juice of their Berryes fermented, of each one pound, water of Earth worms magistral, of Rhadish compound, of Aqua Mirabilis, of each two ounces, Syrup of the juice of Elder-berries two ounces, mix them and make a Julep.

5. Distilled water.

5. Take the leaves of Garden Scurvy-grass, of Hedge-Mastard, of Pepper-wort, of each six handfuls, of the Roots of Calamus Aromaticus, Galangal, of Zedoaria, Orris of Florence, of Elder, Aron, of each six ounces, Winters-bark, Jamaica Pepper, of each three ounces, Juniper-berries four ounces, Cloves, Ginger and Nutmegs, of each one ounce, slice and bruise them, and pour upon them eight pound of old Rhenish-Wine; distill it in common Organs, let the whole Liquor be mixt.

6, 7. Decoction.

6, 7. An Anti-hydropsick Decoction is described above, among the Diaphoreticks. A Diet-drink is to be taken instead of Ale, and is to be made according to the ensuing form.

Diet-drink.

Take of Shavings of Guaiacum, Sassafras, of each four ounces, Florence Orris-roots, Calamus Aromaticus, Galangal, Enula-campane, of each one ounce and a half, of Juniper and Bay-berries, of each two ounces, Anniseeds, Carne, Sweet-fennel, Coriander and Dill-seeds, of each one ounce, long Pepper and Cubebs, of each an ounce and a half, Cloves, Nutmegs and Ginger, of each half an ounce, Jamaica Pepper two ounces, the dried leaves of Sage, Wood-sage, Calamint, Agrimonia, of each one handful, Liquorish four ounces sliced and bruised, boyl it in four gallons of Spring-water to half, the strained liquor being cold, let it be kept in glass Bottles for use; with the constant use of this drink, I have known many labouring with a deplorable Anasarca to be made well. Among many Examples of Dropsies cured, I shall propound but one.

An Example of the Cure of an Anasarca Dropsie.

A certain strong man of a middle age, after he had contracted an Epidemical Quartan Feavour, and being evilly handled from its beginning, had laboured with it above a year, and in the mean while had used an ill course of Diet, fell into an Anasarca, which afterwards in a short space augmented hugely, by reason he indulged himself more freely to drink for quenching his thirst (which was outrageous) so that all his members being swollen from head to foot, and over the very Abdomen it self, he could not turn in his bed from side to side without help.

The Prognostick and Cure of the Dropsie.

When I first visited this man, and despairing of a Cure (as the Physitian in Celsus lib. 3. Chap. 21. who denyed that any intemperate Hydropsick could possibly be cured) I immediately affirmed this Prognostick, That he would dye in a short time unless he abstained from drink. Whereunto he replying, profest he would not drink in a weeks

weeks space, provided he might be helped; and indeed did as he said, although being very thirsty, for six or seven dayes he scarce took any liquid thing in his mouth, but what was Medicine; and during that time, when in the mean while he took Hydragogues, Catharticks and Diureticks, and any other things prescribed carefully, he became much better, and afterwards the method (before described) some while being administred, he was restored to his entire health, and even now though five years since lives and continues sound.

There remain certain other splanchnical Affections, touching the Remedies whereof, according to the ensuing method, we should here have treated, notwithstanding I have performed this task already for the most part under other titles; for as is above intimated, Remedies which concern the Kidnies we have for the most part unfolded under the rank of Diureticks, and those which concern the Stomach and Guts, under that of Vomits and Purges; what relates to the Spleen we have finished in the Hypochondriac Pathologie; and what to the Womb in the Hysterical. As to what appertains to the Genital parts and their Diseases, and help, I reserve for another time and place; it behoves me now next of all, after treating hitherto of the inward Pharmacie, to discourse something of the outward, and of the Reason or Aetiology of the administrations thereof, which shall be done in the next Section, beginning with Phlebotomie, that great Remedy.

*The Conclusion
of this Section.*

SECT.

SECT. III. CHAP. I.

Of Phlebotomie.

*Phlebotomie a
very general
and ancient
medicine.*

AMong the universal Documents of Philosophie, or aids of Physick, none either in Theory or Practice hath been more ancient or general than the speculation of the Blood and letting it out by opening a Vein. As to the former we have in other places often explicated the nature and constitutive parts of the Blood, we have unfolded the Virtues and Energy of the same, and have demonstrated that it is in truth enkindled, and that from the burning thereof the flame of animal life, as of a Lamp, doth begin and receives continuation: But as to what relates to Phlebotomie, all Authors of every age have made mention thereof: Moreover the same was ever in Medicinal use with all Nations howsoever barbarous or rude. Neither is it a wonder, for truly Nature it self in the first place hath taught the necessity, and way of that part of Chirurgery; Even the Divine Law commanding the Rite of Circumcision, as a Symbol thereof, seems to intimate that the innate impurities of Humane Nature ought to be purged in some manner by letting out the blood.

*Nature shews it
by Hemorrhagies.*

That we may methodically discourse of this great Remedy, we ought first to consider, by what means, also for what causes and ends, the letting of blood either happens spontaneously to Nature, or is indicated by the Physitian; then secondly we will annex the chief effects of this Evacuation, as well good as bad, whether advantageous or disadvantageous, and together propound certain Rules and Cautions to be observed, about due administration of Phlebotomie.

*Critical either
with or without
a fever.*

As to the former, spontaneous Hemorrhagies (which suggest the use of Phlebotomy) whereas they are manifold and of diverse kinds, they are usually reduced to these two heads or ranks: to wit, they are denominated either critical, Nature endeavouring something good and wholesome; or symptomatical, which for the most part happen, she being dejected from her government, and being altogether out of order. The bloody eruptions of the former kind are again distinguished; that they are either raised without a Fever, and are either periodical, which happen often at set seasons, as the Flowers in Women, and the Hemorrhoids in some, and in others the solemn or otherwise accustomed opening of the Nostils; which very often succeed according to the great changes of the Year, or alterations of the Air; or they are fleeting and uncertain, as when blood doth advantageously break out of those places; and of many others, one while in this part, another while in that part of the body. Moreover, bloody Crises do sometimes happen in a Fever, and do often put an end to it, as Hippocrates long ago observed, and is now manifest by very common observation. The blood breaks out in all these cases, inasmuch as being turgid, and above measure rarified within the vessels, it desires a larger space, wherefore, unless some portion thereof give way, the whole mass runs the hazard of being constricted, and as well the motion thereof to be hindered, as the enkindling to be suffocated, and the temperature to be perverted.

*The causes thereof
proceed either,*

*I. From the
kindling of the
blood.*

For there are two chief Reasons or Causes, wherefore such turgescencies of the Blood do arise: inasmuch as its liquor is as well inflammable, as fermentative.

I. As to the former of these, that the Blood may be duely enkindled for the supporting Life, and the due exercise of the functions thereof, it behoves that the innate sulphureous particles of it be proportion'd unto the Nitrous adventitious ones from the Air. Therefore as often as the Blood being very boiling and rarified, is much opened and loosened in its own consistence, so that the Sulphur being dissolved, is kindled in greater plenty, there is a most frequent and painfull breathing instituted for the drawing in of a more plentiful Nitre. Now if the Sulphur abounding in this manner, cannot be wasted by burning, nor the vital flame regulated, the next course immediately to diminish the sulphureous fuel, is, that a certain portion of the rarified Blood have vent. From hence, not only in Fevers, but after drinking Wine, Bathings, being in the Sun, and other accidents by which the Blood grows very turgent, either an Hemorrhagia of its own accord succeeds, or there is often need to supply the defect of such a spontaneous evacuation by Phlebotomie. But that such kind

kind of effusions of Blood, whether made by Nature or Chirurgery, are commonly reported to bridle its heat or raging; really they do this only inasmuch as they diminish the kindling of the blood, by withdrawing part of the sulphureous fuel, as Oyl from a Lamp.

2. But moreover in the second place, the Blood, inasmuch as it is a fermentative liquor, it is apt also to be extravasated. Namely, if at any time any heterogeneous thing, and not miscible, be confounded with its liquor, it grows hot very much, like Wine in a Vessel, and boyls up in the Vessels to exclude that disagreeable thing, which if it can neither subdue, nor turn off by Sweat, Urine, or otherwise, the Blood it self excludes part of it self as a Vehicle for carrying that matter forth, wheresoever a vent is to be found. For this reason (*viz.* that any disagreeable or indomitable thing may be turn'd out of the mass of blood) divers sorts of Hemorrhagies happen, as well in Feavers as without them; all which are excited by Nature for an intention of good, as also those by which the too much enkindling of the Blood is depressed: But that frequently it happens otherwise, ought to be imputed to divers accidents and circumstances. But for the most part the failure about the spontaneous Hemorrhagies critically instituted, is either in the first place because the blood while it is boiling knows no measure of flowing out, and therefore being stirr'd into violence, it flows out too much; or secondly, because the mouths of the vessels once opened do not presently close again, nor are able to be shut; or Thirdly, because Nature endeavouring an excretion of blood, doth it by places more open, but often inconvenient; as when an Hemorrhage happens through the Lungs, the Kidneys, Guts, or other Bowels, which therefore pass from a Critical into a Symptomatical and often into a malignant Hemorrhage.

2. From its Fermentation.

1. Critical Hemorrhagies sometimes turn into Symptomatical.

Neither only by these means, but by many other failings of Nature, or impediments, do Symptomatical Hemorrhagies happen, in all which either the Blood it self, or the Vessels containing it, or both of them together, are wont to be chiefly in fault.

2. Symptomatical Hemorrhagies arise either,

1. In the first place, the Blood, besides the reasons above mentioned, (to wit, forasmuch as it becomes inflammable or fermentable above measure) is apt also to be extravasated, because either its liquor being empoisoned, or otherwise corrupted, cannot retain its due mixture, but being apt to coagulate or putrify, divides it self into parts; and whilst some of them being here and there planted, sending forth spots, wheals, and other brands of Malignity, do discolour the Flesh and the Skin, and obstruct the proper passages; others otherwise running out and breaking forth wheresoever there is a vent found, do produce bloody Excretions in divers places, as is commonly discerned in the Plague, Small-pox, Measles, and malignant Feavers; yea perhaps this in some measure is the reason why in scorbutick Distempers, as spots and marks, so also Hemorrhagies are so familiar.

First by the fault of the blood.

2. Secondly, The vessels bringing Blood being faulty many and divers ways, but chiefly in these three, do appear the cause of a symptomatical Hemorrhage, *viz.* In the first place, if perhaps any where some of them are obstructed, as often as the blood assumes a more rapid motion, either in the same place, or in the contiguous parts, and also sometimes in remote parts it is constrained to burst out. Frequently from such a cause an Hemoptoe proceeds; moreover Spitting of blood, and the Hemorrhage of the Nostrils do often follow the suppression of the Terms and Hemorrhoids. Secondly, the little mouths of the vessels (by reason of the fleshy Fibres being loosened or resolved by which they are clos'd) sometimes are ill formed, so that when the ends of the Arteries do gape too much, the little mouths of the veins do close. By reason of this affection, Scorbutical and Cachectical persons, are found obnoxious to Hemorrhagies; as we have remarkt in another place. But Thirdly, it frequently comes to pass that the Vessels, being so evilly formed, are also convulsively affected, and so the morbid cause being as it were doubled, this evil is much encreased, insomuch that the muscular fibres of the Vessels being inordinately contracted, cause sudden and violent fluxes of the blood, one while towards the upper parts, another while towards the lower; and so their little mouths being open in the mean time, they provoke prodigious Hemorrhagies. For I have observed in some persons, when the current of blood was small enough, with a small and weak pulse, the Convulsions of the Vessels generated in some place, and propagated under the likeness of wind running to and fro in the body, to drive more impetuously the blood, however slow of it self, and to constrain it into violent eruptions; and in cases of this

Secondly, The fault of the Vessels, for that they are ill formed.

Thirdly, Forasmuch as they are convulsively affected.

fort,

fort, when Phlebotomies and Medicines refrigerating and tempering the blood have not at all profited, the greatest relief hath been found from Narcoticks, Antispasmodicks and Ligatures.

3. From the blood and vessels being both in fault.

3. Thirdly, If perhaps it shall happen that these faults of the Blood and Vessels are complicated, and put forth their mischiefs jointly at once; from thence it will be of necessity that this evil will be more intense, and more frequent and prodigious Hæmorrhagies will be raised; the reasons of which as they appear plain enough by what goes before, it will be neither necessary nor seasonable here longer to dwell upon explicating of them; but rather, whereas we have designed hitherto the acts of Nature about spontaneous effusion of Blood, and its courses both rightly instituted, and also wrongfully and evilly constrained; now it behoves us next to declare, how far Art (for the most part the Ape of Nature, and sometimes Mistress or Moderatrix thereof,) can act likewise well, or better about letting of blood, and how sometimes it is wont to succeed worse.

Emission of the Blood procured by art.

We advertise of these things in general, that a Physician imitates Nature in some cases of letting blood, exceeds her in other cases, and frequently regulates and reduces her when acting amiss. Moreover, there are some cases wherein Nature excels far the efficacy of Art concerning bloody excretions; briefly of each of these.

1. It either imitates Nature.

Therefore in the first place, in whatever affects, spontaneous Hæmorrhagies are wont to bring help, when these are wanting, Physick the Handmaid of Nature rightly substitutes Phlebotomie. Therefore, if perchance the Blood be immoderately kindled by reason of its Sulphur being too much loosened and advanced, by breathing a vein, what is superfluous of that inflammable fuel will flow out, as also the immoderate turgescency of Blood, by reason of somewhat untamable being mixed with it, will be allay'd by this course. Wherefore letting of blood is advantageously administered, as well against continual Feavers, which proceed from the former cause, as intermittent Feavers, whose fits proceed from the latter cause. Also in like manner, as often as an accustomed evacuation being suppressed, or a humour driven back from the outward parts, or a sudden stoppage of the pores, or if a Surfeit, drinking of Wine, or other accidents of this nature, cause a turgescency of blood (inasmuch as they dash heterogeneous particles against it) Phlebotomie is usually the most ready Remedy.

2. Or excels and regulates it.

Secondly, Physick in Blood-letting, not only imitates Nature, but often excels it; and also succours her being weakened, and reduces her often erring. For if at any time the blood struck with violence, rushes in a heap against any part, and either presently breaks out in the same place, or abundantly gathered together engenders an Inflammation, a vein being pierced in a remote place, stops that preternatural tendency of the blood, and frequently carries away the bleeding, or inflammation. Wherefore, in a Pleurisie, a Squinancy, a Peripneumonia, in spitting or vomiting of blood, when Nature is vanquished, or being outrageous, seems to cast violent hands upon her self, Chirurgery recalling the blood to another part, and sending it out, restores the matter that was almost desperate.

Moreover Physick frequently restrains or reduces Nature, when too prodigal or prevaricating in pouring out of the blood: for in truth all immoderate Hæmorrhagies do want Bridles, not Spurs. But in the Plague, Small-pox and Measles broke out, and in malignant Feavers, sometimes the blood spontaneously flowing out, portends for the most part evil; therefore in those affects styptic Remedies, or things stopping the eruption of blood, are more convenient than breathing of a Vein.

3. Or Art outdone by Nature.

Thirdly, Notwithstanding on the contrary there are cases of shedding blood by Nature, which Physick can no way imitate, neither if they chance to fail, can be supplied by Phlebotomy. In Feavers about the Crisis of the Disease, to wit, after the digestion of the matter, that is to say, the preparation for Excretion, spontaneous Hæmorrhagies if coming in time, do far excell any Phlebotomie which none knows the best season of; Moreover, the Fluxes of the Terms and Hæmorrhoids happening by Natures instinct, are more advantageous than the mission of blood provok'd by Art in any of those places.

Phlebotomy and spontaneous Hæmorrhagies differ as to the subject and matter.

Between Phlebotomie and spontaneous Hæmorrhagies, there is yet a notable difference, (although not of great moment in Physical practice) viz. both as to the Subject and Matter of either of them; for in this the blood being florid, and thoroughly Scarlet, doth for the most part only flow out of the Arteries, but in the other Evacuation the Blood being of a black purple with a Scarlet Cream, is only drawn out of the vein.

vein. Whence the stream of Blood, which is one within all the vessels and throughout continuous, acquires such a diverse kind of appearance, seeing we have shewed in another place, it is not our present purpose to make any further search into this *Ætiologie*; because it concerns not much to the curing any distemper, out of what vessel the blood be let, provided it flow out largely: But that the ancients do in some cases commend Arteriotomie, and prefer it to an incision of a vein, the Circulation of Blood not being then known, we have elsewhere discoursed how well it may be done.

Hitherto of Phlebotomie compared with a spontaneous Hæmorrhage; now our next business is, to describe the use and effects thereof, as well good as bad, in Physical practice. Wherefore we will first shew in general what alteration of the mass of Blood this Evacuation brings; then what diseases it more immediately respects, either of the whole body, or its particular parts.

About the former, it is obvious enough that the blood is altered by breathing a vein, both as to its quantity and temperament, and as to its disposition and motion.

The use and effects of Phlebotomy.

How it affects and alters the Blood.

The first and most common Indication of Phlebotomie, is, that the plenty of blood be diminished by this Administration. And truly this is a vulgar Remedy, to remove or provide against a Plethora. Any one, though of the vulgar sort, growing to a full habit of body, lets blood without the advice of a Physician; Moreover Rusticks and Countrey men for healths sake, once or twice in a year cause blood to be drawn from themselves and their Beasts. But although this custom is grown so much in use with some prodigal of their blood, that they breathe a Vein on the smallest occasion, and sometimes without any manifest cause; notwithstanding we may find many others no less obstinate against this custome, insomuch that for no cause will they lose any blood, unless the greatest necessities be urgent.

1. Diminishes its quantity.

Emission of the Blood is not to be either too prodigally, or too slenderly made.

Upon this matter (whereas Arguments are alleadged on either part,) that I may in few words determine what seems fit to be ordained, in the first place it is requisite we grant, that letting blood is convenient against a Plethora either made, or beginning: for by no other Remedy are the evils of that Affection wont to be better removed or provided against. Notwithstanding, the necessity of this evacuation ought to be declined as much as may be; because from thence (as we have intimated elsewhere) the blood becomes more sulphureous, and less salt, and for that reason it most commonly disposes all men to be feverish and to be fat. Moreover the Great Remedy Blood-letting, if it be prostituted to every little occasion, becomes less efficacious to any grand affections when need requires: To which we may adde, that according to the vulgar observation, by how much the more familiarly any one uses Phlebotomy, he will the more frequently stand in need of it: for blood being emitted to avoid a Plethora, the rest of the mass will the sooner rise to a Plethora: far otherwise than is the opinion of some, who dread lest the store of blood be consumed by frequent Phlebotomie; for that on the contrary by this means the quantity is more encreased, although the Crasis be the worse: for so the blood having lost much of its balsamick Salt, and preservative against putrefaction, instead thereof, is filled with a pinguifying and more fiery Sulphur.

The reasons of the former hinted at.

Secondly, Phlebotomie doth frequently correct the mixture and temperament of the blood in a manifold respect. For in the first place, if any thing heterogeneous be confounded with its mass, which cannot be rightly digested, nor easily excerned and sent away: a Vein being opened, the blood flowing out conveys frequently much of the portion of that matter forth with it, insomuch that the rest may be either subdued or expell'd. For the orifice of a vessel being opened, presently the blood fermenting gathers together the extraneous particles as much as possible, and excludes that portion of it self wherein many of them are heaped up: From hence we may observe the blood flowing out first and last to be well enough, when that emitted between appears corrupt. Also secondly, the blood declining from its temperament, is frequently restored by Phlebotomie. For when the mass thereof by the Sulphur or fixt Salt, or both together being exalted, shall degenerate into sharp, salt, or saline-sulphureousness, a portion of the blood being withdrawn, immediately a new fermentation thereof arises, and very often there is a transposition made of all the particles of that sort, that afterwards the Spirits may a little emerge with the volatile Salt, and recover their dominion, the Sulphur, and fixt Salt (as is fitting) being subdued. For this reason it is that letting Blood doth not only confer great

2. Phlebotomie amends the mixture of the Blood.

It restores its temper.

help in Feavers, but also in the Scurvy, Jaundies, and beginning Consumption; for the blood after the vessels are empty'd, like the Stomach disburden'd, doth better digest and assimilate any humours ingested, and the more easily throws off and separates whatever is heterogeneous.

Some distempers of the blood admit not Phlebotomy.

But if the mixture of Blood begins to be much loosned and become very bad, as in the Plague and malignant Feavers, we must altogether abstain from Phlebotomie; for the blood being withdrawn, the store of Spirits (whose only part it is to vindicate the mass of blood from putrefaction and corruption) is diminished, so that immediately all things tend to a deadly dissolution. Moreover, if the Dyscrasie of the blood shall be of that manner, that the more noble Principles, to wit, the Spirit, the volatile Salt and Sulphur, being depressed or consumed, the watery and earthy particles predominate, the blood ought not to be sent out, but preserved even as the treasure of life; for when the abundance of Spirits are so small, any loss of them doth cause all the functions to stagger, and gives way to the disease; wherefore in a Dropsie, Cachexia, Consumption, and other Distempers, where the active Principles are greatly depressed, the opening a vein is almost the same thing as cutting the mans throat.

In some cases about Phlebotomy it is very doubtful.

In the before-mentioned cases, where the temperament of blood is respected, it is easie to determine, whether Phlebotomie be convenient or not; but in some others, as in a putrid continual feaver, when upon this hinge Life and Death are turned, there is need of the greatest deliberation: and so much the rather because the event of the Disease, and the success of all the accidents in its whole course, whether good or bad, is usually imputed to Blood-letting, or its omission: and from hence it is, that Physicians being solicitous to preserve their own repute, do chiefly raise doubts in their consultations of this matter. But truly in this difficult knot that we may not be led by the rumour of the vulgar (as it chanceth to happen) one while approving, another while condemning Phlebotomie, but with more certain advice: we must consider the state of the Blood, the tendency of the morbid matter, and the strength of Nature. First as to the former, if in a putrid Feaver, the blood very much growing hot shall raise a great heat, with thirst, watchings, and burning of the Jaws, and no eruption of abundant sweat, nor pushes appear, or is suddenly expected, opening of a vein is so clearly demonstrated, that it is a wickedness to omit it; but on the contrary if in a languid body, a slow and remiss Feaver, but continual, arises, with a weak Pulse, let Blood-letting be spared, and the cleansing thereof be procured by breathing Sweats, Urine, and blistering. Notwithstanding, in a middle state of Blood, and of a Feaver, Phlebotomy almost indifferent in it self, is determined by other things. Therefore secondly we must weigh the tendency or flux of the morbid matter, which if it remain dull in the mass of blood, and unfit to be separated, and so (as it is frequently wont to be) instead of a Crisis, a translation towards the head be made, and threaten the brain and nervous stock, the cutting of a vein ought seasonably to be administr'd, whereby these evils may be provided against. Notwithstanding, if that this matter being soon raised into a rage, and either rushing inwardly to the bowels of the nether Belly, provokes a huge Vomiting, or Dysenterical affections, or being driven outwardly, seems to be about to bring the Small-pox, Measles, and other pushes, every such force of Nature, if good, ought not to be disturbed, if evil, not to be made worse by Phlebotomie; for in these cases it is not only dangerous to let blood, but also very scandalous. Thirdly, about Phlebotomy to be administr'd in a doubtful case, we are to take heed to the strength of the Patient; for in a healthful Constitution, a vigorous Age, the commencing of a Disease, and the functions both vitall and animal being yet in a florid or indifferent estate, we may confidently prescribe letting of blood, unless something indicates the contrary. Notwithstanding, when it is otherwise, as to those conditions, we may not rashly proceed to that Evacuation.

How the doubt is to be determined.

Thirdly, Phlebotomy corrects or stays the inordinate motions of the blood.

Thirdly, the inordinate motions of the Blood, when being very much moved, as it were with fury, it either rushes impetuously one while into these parts, another while into those, or transfers the noxious matter, are best restrained or reduced by Phlebotomy; wherefore in great Cephalalgies, in all soporiferous or convulsive invasions, for Catarrhs, Ophthalmia's, and a Cough, Asthma, fits of the Gout, and Stone, or Phlegmons, Erysipelas's, also for many other Distempers, raised by the flowings of the Blood or Serum; an incision of the vein is commonly preferibed, and indeed for the most part as with good success, so also upon right Reason; for the Vessels being emptied,

emptied, the blood having obtained a more free space, is circulated pleasantly and undisturbedly, besides, whatever is extravasated of the Blood or Serum, is wont to be sucked up again and reduced into its course.

The Effects as well good as bad being thus shewn, which happen to the blood in the manifold state thereof, by Phlebotomie; we will next make strict examination what Diseases chiefly, either of the whole body, or of any private Region that kind of Remedy doth more immediately regard. And first as to what relates to general Distempers, it is commonly enough known, that letting blood is indicated by a hot and dry temperament, and interdicted by a moist and cold. It is usually propounded in every Feaver, but never in a Dropsie. Moreover, if we consider particular Diseases, there is no region or part of the Body, but as they rejoyce in the influence of vital as well as nutritious blood (as long as it is well) so as often as it is disturbed in any place, or reaches out any disagreeable or provocative thing, in place of benign Juice, it requires avocation and a letting out thereof. If I should take notice of every single case of this Indication, we should here rehearse almost the whole Pathologie of the humane body. An aking Head, a Brain oppress'd with blood, or overflowed with Serum (whence spring a world of evils) burning of the eyes, inflammation of the face, mouth and throat, all the diseases of the Breast and Præcordia (inasmuch as the disorder of Blood affords a rise or fuel to each of these) likewise obstructions or inflammatory affections of the Liver, Spleen, and other Bowels; moreover, as a Plethora, and Athletick habit of the whole body, so also the tumours of each member, painful and convulsive passions, seem to accuse the blood as Author of all the evil, and require its sending out, as a certain kind of revenge.

what Diseases, and of what parts Blood-letting chiefly respects.

In these and very many other distempers, if at any time Bleeding be clearly indicated, before it be performed four things ought to be considered, viz. In what place, by what manner and instrument, at what season, and in what quantity the Blood ought to be taken away.

After Phlebotomy being indicated these four things following ought to be considered.

First, as to the former, although according to the Laws of the Circulation of the Blood, as oft as the mass should be diminished, it differs little from what vessel a part thereof be taken, provided it be large enough; notwithstanding, for that besides a general evacuation of the blood, sometimes a particular one properly called Derivation (as when the blood is to be brought out of a private place where it is accumulated) and moreover a Revulsion, when it is to be called into this or that part, are intended; for that reason, in a humane Body there are appointed as it were various Boundaries, out of which, now by this, now by that, or by another vein, the blood may be emitted as occasion is given, and for the uses chiefly requisite.

First the place from whence Blood is to be taken.

If therefore at any time an universal Evacuation of the blood be indicated, the median vein of the Arm is best to be opened, for this is easily opened being large enough, and whereas it equally flows from the whole body to the orifice thereof being open enough, by whose more free efflux not only a Plethora is taken away, but the greater vessels being every where emptied after this manner, the blood stagnating in any place, is brought into motion, and being extravasated is again swallowed up into the veins; wherefore, in great distempers when the blood being heaped in the Brain, or Præcordia, does threaten sudden destruction, the best way not only of general Evacuation, but of a Revulsion, is to send the blood by a full current out of the vein of the Arm, being largely open'd.

In some cases from the Arm.

But if without any great Plethora the blood ought to be evacuated from the whole, and pulled back from the upper part of the body towards the inferiour, as in the suppression of the menstrual flux or Hemorrhoids, it will be rather fit to bleed in the Foot or sedentary vessels by Leeches. But if after the blood being evacuated from the whole, it be also to be derived from any private part where it is accumulated, let its drawing off be near the place affected. Hence in Cephalick Diseases, we open the vein of the Forehead, of the Temples, or of the Throat. To cure Tumours, or pains raised in the Joynts, we cut a vessel either beneath or near them, or draw out the blood by Cupping-glasses or Leeches. In like manner in distempers of the Thorax and nether Belly, either Cupping-glasses are applied to the region suffering, or Leeches to the sedentary vessels.

In others from the vein of the Forehead, Temples or Throat.

But that some Vessels are reported to bear a peculiar respect to certain Bowels, and that they ought to be lanced in their distempers; viz. such are the outward brachial vein, which is said to respect the head, and the inward the Liver, also the outer vein of the Hand tending to the Ring-finger, which is said to respect the Spleen, and for that

The Cephalic Vein of the Arm, the Liver Vein, or the Salvatella erroneously so called.

that cause this is called the Salvatella, and the former of them the Cephalick, and the other the Jecorary; all this is meerly a vulgar error, which being propt by no reason or Anatomical observation, I am ignorant whence it took its origine: Therefore as soon as it is agreed on to cut a vein and its place, let a large Vessel be chosen, and very conspicuous, that it may the more easily be opened; and being remote from an Arterie, Nerve, and Tendon, may be the more securely lanced; wherefore in the Arm the median vein is commonly chosen, although the Cephalick being less environed with other Vessels, is the more safely opened.

The jugular Vein is most safely opened.

The Jugular Vein is almost always opened as often as blood is let in Beasts, it is a wonder it hath not obtained the same Custom in Man, when the large and eminent Pipe hereof may most easily and safely here be cut, because it neither hath an Arterie for its companion, and lies a great way from any Nerve. Moreover, from this vessel as from any other whatsoever opened, an universal evacuation of blood is made from the whole body, and together the best derivation thereof from the head, so that all the stagnations or aggestions of the Blood and Serum are discharged thence.

Of Veins in the hand or feet.

Concerning Vessels in the foot or the hand there is no great reason of choice, but take the vein which chiefly swells: it matters little concerning the Place, unless that if incision be made above, or near the Ankle, there is great care to be taken lest a Tendon be hurt, which sometimes by unskilful or rash Chirurgeons happens to the damage of the Patient. Moreover, let care be taken lest a vein be cut near its Anastomosis with an Artery, for if this be committed, the blood being entirely Scarlet, will impetuously skip out, and the flux thereof is not easily stayed, nor the orifice of the vessel soon stopt.

We ought to consider by what means or by what instruments the Blood ought to be drawn forth.

The chief places being thus designed of letting forth the blood, and the choice of the vessels being shewed, we ought next to treat of the Manner or Instruments by which blood is drawn out; which is used to be done either by a Lancet, in cutting the vein, or by suction by Leeches, or by Cupping-glasses after Scarification. But there is no need of discoursing these, because each of these parts of Chirurgerie are every where in familiar use by Quacks, Barbers and Women, and all things relating to them so commonly known, as a man his own house; wherefore we will speak but one word.

Some of the Ancients as well as Modern have ridiculously exclaimed against letting of Blood.

Helmont of late, and still certain followers of him, Pseudochymists and Fanaticks, have ejected Bleeding out of all Physick, because they think this evacuation to be a great injury to Nature, (which being aided either by her own strength, or by their Panacea's, they will have to overcome every offensive thing of her self;) Surely, this is no less ridiculous a thing than that long since *Chrysippus*, *Apamaneas*, *Strato*, and some others, (as *Galen* reports) damn'd this remedy, because a vein is difficultly known from an Artery. Truly it is manifest enough by sad experience, that in cutting a vein sometimes an Artery hath been pierced; whence either death or loss of the member sometimes ensues: the reason whereof is, not as is commonly alleadged, that the coats of an Artery being more nervous or membranous than the coats of a Vein, can scarcely or not at all be healed; when in truth that Vessel is endowed with more and thicker fleshy fibres; but the cause is, that an Artery like the Heart it self, ought incessantly to shake and beat, the fibres thereof repeating perpetual turns of Systole and Diastole; wherefore, a little hole being made in its Pipe for the most part remains incurable by reason of the continual motion of the Vessel, and the efflux of blood. It is otherwise in a Vein whose opening is immediately stopt of its own accord; for but little of contractive work lies in its Coats, yea this only, that its fibres being lightly opened as occasion serves, the blood flowing back of its own accord, is gently moved forwards; and after Phlebotomy, the vessel being empty, they are permitted to be quiet, so that in the mean time the little hole made by incision is easily glewed together. Whenever Physitian or Patient do dread the opening of a vein to be administred, drawing of blood by Leeches or Cupping-glasses, will aptly enough and with like advantage supply the defect hereof. Moreover these administrations to remove the conjunct cause of a disease, where there is need rather of partial than general Evacuation or Derivation, are frequently preferr'd to Blood-letting it self. There is no need to dwell longer on explicating the manner and reason of the effects of either of these operations, commonly enough known, but proceeding to other things, we will next thoroughly weigh the Time and Quantity of letting Blood.

wherefore in opening a Vein the pricking of an Artery is so dangerous.

The

The opportunity of letting blood is often of so great moment, that whereas this Evacuation succeeds well at one time, at another it highly prejudices: But there are diverse respects of time to be considered about the due performance of Blood-letting, but chiefly these four: The Time of the Disease, the Age, the Year, and Day: The first concerns chiefly the Cure of the Patient, the others the Preservation of him.

First therefore if blood ought to be let in any Disease, it will be chiefly seasonable about the beginning or encrease thereof, but not at all or very cautiously in the state or declination. For at that time whilst Nature is busied, endeavouring a Crisis, so that the Spirits are in great labour, and the blood ferments very much, that great endeavour of it ought not to be disturbed; and in the height of the disease, either Nature being Conqueress doth not want such a relief, or being subdued will not endure such an Evacuation.

Secondly, If at any time for preservation it be deliberated touching letting blood, Infants, Boys, and Old men, by the Custom of all Nations obtain an exemption; also this evacuation was wont to be interdicted to pregnant Women, but now most commonly prescribed. Men of a vigorous Constitution and middle Age, do well enough endure Phlebotomy, and often times want it. Notwithstanding the first and second time it ought not to be done without great occasion, for that being once begun and afterwards repeated, it will soon proceed into an inevitable Custom.

Thirdly, Hence they who used to let blood Spring and Autumn, afterwards cannot omit this evacuation without hazard. But to whom it will be either profitable or necessary to breath a Vein once or twice a year, the chief seasonable times will be in the beginning of Spring and Autumn, viz. when the Blood being prone to ferment anew, is in danger to change its Crisis. Phlebotomy seasonably administered, provides lest the Sulphur and Salts being exalted, it should contract a feaverish, scorbutical or other peccant distemper; likewise, lest suffering a flux, it should pour forth the serous Recrements, and other Feculencies upon the Brain, the Lungs or Bowels of the nether belly. About the Solstices, when our bodies are very cold, or hot, the blood, as the juice of all Vegetables, consisting in a more fixt state, and unapt to swell up, ought not to be let out, unless upon some urgent cause.

But whereas some precisely, or rather ridiculously, observe about Phlebotomy, (even as the Country-men about Gelding Cattle,) the position of the Heavens, and the Aspects of Moon and Stars, it appears altogether frivolous; and for that chiefly is this Custom condemned, inasmuch as counterfeit Astrologers have a Figure in their Almanacks wherein every sign of the Zodiack, is allotted to every particular member of our bodies; and for that cause, under what sign the Moon is conversant, they forbid blood to be drawn from the respective part of man. They who observe without reason the Heavens, do erre (as the saying is) the whole compass of the Heavens. Moreover, this vulgar error is not only absurd, but frequently malevolent, inasmuch as many of the common people will abstain from Phlebotomy whatever indication makes for the same, if (as they say) the Sign be in the place of letting blood.

Fourthly, As to what relates to the time of the Day, in acute Diseases, when a Physician is sent for, and there be indication for Phlebotomy immediately to be performed, after the body is prepared, he may prescribe that operation any hour in day or night; but otherwise, if any interval may be allowed, then breathing a Vein rather is to be celebrated in a morning when the Stomach is fasting, the vessels emptied by sweat in the night, the stream of blood being quietest, and appearing free from any serous filth. Yea although necessity urge, it may be deferr'd a little untill the new Juice of things eaten be pass'd into the blood; for the vessels being emptied will not only snatch the crude Chyle into themselves, but frequently what is disagreeable or unproportionate unto the blood, whence not only its motion is disordered, but also the vital flame runs the hazard of being extinct. I have known some by Phlebotomy administered presently after plentiful Drinking, or pouring in of vinous liquors, to have fallen into dreadful swoundings away, which have lasted very long, untill the vital spirit being almost overwhelmed recovered it self again.

Moreover, in the fifth place, the opening the vein being indicated, and its time appointed, there remains still no little consideration to be had, what Quantity of blood is to be let out, in which point there is most commonly a fault committed, while some being too audacious, and others no less timorous, they affix those bounds on this or that side of which for the most part consists the Right. For that I may omit

Thirdly, The Time of letting Blood comes in to consideration.

1. In respect of the disease.

2. In respect of age.

3. In respect of the Year and its parts.

The Aspect of the Moon and Stars are here of no moment.

4. The time of the day about letting of Blood.

5. The Quantity of the Blood to be taken away ought to be considered.

Too much Phlebotomy to be avoided.

But a more spare Bleeding often hurts, and fixes a fever.

The Reason of which is declared.

In some cases the mission of Blood must be altogether avoided.

Phlebotomy ought ever to be done with a large orifice.

omit those who scarcely or not at all admit of Phlebotomy (as I have before hinted) so I cannot easily assent to their practice who fear not to draw blood to swoonings: Besides, an error of no light moment is committed within the moderate bounds, while in some cases blood is drawn by too sparing a hand, and in others with too free. In a burning Fever, Pleurisie, Peripneumonia, Squinancy, Frenzie, Apoplexie, and other great diseases, that have their origine from a turgescency or phlegmonic incurfion of the blood, a sparing Phlebotomy doth always more prejudice than advantage. For besides that it doth not remove the antecedent cause of the disease, to wit, the Plethora, it further causes the conjunct cause, viz. the inflammation and bursting out of the blood to be augmented. For truly it is a constant observation, that upon blood too sparingly drawn, the whole mass doth boyl up more notably, and doth acquire a new flux into the part affected; the reason of which is, that in a great Plethora many portions both of the Blood and Serum being thrust forward into recesses and strait places, are there constrained to abide; which, after the Vessels being a very little emptyed, do impetuously regurgitate into the mass of blood, and do much disturb it, and force it more impetuously to and fro. Wherefore also in this respect the vessels ought to be very much emptyed, viz. that besides freeing the former Juice from straitness, also space may be given to the Juice reduced from exile, which otherwise being not congruous, coming upon the blood, troubles it, and provokes it into effervescencies and eruptions. From hence we may observe, that almost all men grow more hot presently after Phlebotomy, and yet the blood being sufficiently evacuated, a little after they enjoy a more temperate condition.

But as a slender withdrawing of blood in some cases is not only vain, but is performed with prejudice, so in other cases too much effusion is rarely committed scot-free, and sometimes brings notable detriment of health. For when either strength languishes, or the body labours under a notorious Cachexia, we must spare Blood-letting, and its taking away is either prohibited, or being indicated by some accident, is allowed but in a small quantity. Wherefore in men endowed with a weak, tender and cold Constitution, and in consumptive persons, those affected with a long or malignant Fever, also in Hydropicks or Cacochymicks a vein is not rashly to be breathed, at least if it be, much blood is not suffered to be taken away. It will be an impossible thing to prescribe general Rules, according to the particular cases of every individual person, whereby the quantity of letting Blood may be exactly proportion'd according to the strength of the Disease and the ability of the Patient; but let this be left to the judgment of the prudent Physitian present, and let his Commands be ever exactly observed; And let not (as it every where is) such leave be given to Quacks, Empiricks and Barbers to play with humane life, who every where rashly and wickedly use Phlebotomy; and if the blood spring more freely and appear discoloured, therefore bragging of the vessel being well pierc'd, they say it must be let out more plentifully, because it appears bad, when oftentimes on the contrary it ought to be spared.

As soon as the Quantity of Blood to be taken away is determined, our next care ought to be, that a more large orifice being made, the blood equally mixt may flow out as soon as may be; for otherwise, if it go out from a small hole, or drop by drop, or with a little stream, the mass of blood fermenting will separate into parts, and what is more subtile and spirituous will burst out, the thicker and seculent remaining behind. Hence it is to be observed, that the blood being let out of a large orifice with a more full stream, if it be a little stopt with the finger clapt on it, and a little after suffered to flow out, the blood going out the second time becomes much purer and brighter than the former, because in the interval of flowing, the more subtile particles being unfolded from the thicker, and accumulated together, have prepared themselves to fly away. Wherefore, if Hippocrates's Precept shall be observed, viz. to let it run to the change of its Colour, it behoves us to procure that it spring out quickly, with a full and not interrupted stream. Besides all this, as to what appertains to the alteration of the blood let out, and cold, and to the inspection and the judgment thereof, for that we have often discoursed it in other places, we now pass it by, hastening to other things; and now the thread of Method leads us to entreat of Remedies opposit to Blood-letting, to wit *Ischamones*, that is, those which are convenient to stop immoderate Hæmorrhagies, whether engenderd by Nature or by accident.

SECT. III. CHAP. II.

Of Remedies restraining or stopping of Blood.

EVEN as Art imitates Nature in letting forth the blood by Phlebotomy offending in plenty, or temperament, or in its motion, so it succours her being diseased or working wrong, by stopping the flux of blood whensoever it is immoderate or hurtfull. Whereas there are various and many species of an Hemorrhage, there is no need of Physick for them all. If perhaps a great effusion of blood happens by a solution of unity, excited by an outward accident, as a wound, or stroke, Chirurgery suggests the manner of Administrations whereby it should be restrained. Moreover, an Hemorrhage as long as it shall be Critical, ought to be disturbed by no Medicine, but left to the meer government of Nature (as long as she does aright use her power;) and as to the Symptomatic, whilst it is little or not much troublesome, there is required no Physick: notwithstanding there is great need of it, if at any time the Flux of blood be either immoderate, or flow out by unapt places.

Every Hemorrhage is not to be stoppt.

Eruptions of blood of this last kind chiefly challenge a Cure, if perhaps the blood be cast upward by Coughing or Vomit, or downwards by seige, or thrown off through the Ureters. For in these cases, though the quantity of the Blood excreted, be not much to be dreaded, notwithstanding because often a dangerous or mortal Ulcer ensues the solution of the Unity so made in the Lungs, or in the Stomach, Guts, or in a Vein; therefore we must industriously rancounter those Hemorrhagies from their first appearance. Therefore among the Diseases of those parts, such bloody excretions are accounted; but we have already in another place delivered the Theories of Spitting Blood, and of the affection Dysenterical, and the reasons of healing them, so that there is no need to repeat them here; neither also to propound here a remedy for bloody Urine, for that it belongs to the Nephritic Pathology; wherefore we will pass to those Passions, for which by reason of an immoderate efflux of blood, there is great need of restraining Medicines.

But only the immoderate and inconvenient.

The kinds of these Affections are chiefly three, viz. Hemorrhage of the Nostrils, of the Flowers, and the immoderate Flux of the Hemorrhoids: The Cure of which last doth belong more to Chirurgery than Physick, and I think it best to referre the other to the hysterical Pathologie. Here properly belongs to this place the blood flowing out of the Nostrils, being the most general kind of passions of that sort, and common to every Age, Sex and Temperament, so that from the Diagnostick and Therapeutick of it duely assign'd, the uses and efficacies of Medicines stopping blood will best appear: for what we proffer for the unfolding the Causes and Cure of this bloody eruption, may be accommodated unto all other dreadful Hemorrhagies.

The chief Cases of the latter are reckoned.

And also of the former.

It is observable enough, that the Flux of blood from the Nostrils doth happen to most men from extraordinary occasions; for as oft as the blood, about to break out through its own turgescency, or through laxity of the vessels, is apt in some place to make or find its way, it is, by a certain instinct of Nature, very often directed to the Nostrils, as to the part most easily opened. The vessels from whence it flows in that place, are slips of the arterial Branch going from the Carotides, after having pass'd the Cranium, it comes to the basis of the Cerebrum; for this proceeding near to the mammillary Processes, sends very many twigs from it self every where about, of which some eminent ones passing the hole of the Sieve-like Bone with the smelling Nerves, are distributed through the glandulous membrane, investing the windings of the top of the Nose. These nasal Arteries departing first from the Trunk of the Carotides within the skull, anticipate part of the blood chiefly ferous from the brain, and lay aside the Serum it self and other watery recrements into the glandules of the Nostrils, as into the proper Emunctories of that Region, whence they distill into the cavity thereof. Wherefore, if the mouths of those little Arteries do alwayes gape somewhat by reason of the sweating out of the Serum, it is no marvel if the blood it self being made more turgid, opening them a little more (which often are too loose of themselves) bursts forth of dores. Indeed this Emissary both of the Serum and of the Blood, being apt ordinarily to open, or on any occasion,

For the present the Cure of the Hemorrhage of the Nostrils is only propounded.

A description of the Vessels from which Blood flows.

prevents

They are the same by which the Serum distills to the Nostrils.

The Blood flowing forth in too great plenty from these Vessels, is very hurtfull.

The causes of such an immoderate flux.

1. From the fault of the Blood.

2. From the fault of the Vessels.

Prognosticks.

Three primary Indications of Cure.

prevents or cures great incommodities of the brain, or of the Præcordia, yea and sometimes of the whole body.

For in the first place, this way the Serum (as I said) is derived from the head, and when the mouths of those Vessels are vellicated or provoked by any sneezing Medicine put into the Nostrils, the Serum is from thence more abundantly drawn out; which yet doth not descend from the Brain (as is commonly thought) but is anticipated by these nasal arteries, lest it should go to it; from which when it is more plentifully drained and brought forth by the use of Errhines, for that cause the Brain becomes more serene and exempt from vapours. Then secondly, lest the Brain should be overwhelmed at any time by blood more impetuously overflowing, a portion hereof passing through these vessels and breaking out, easily prevents it.

But sometimes it happens that an Hemorrhage of this kind, rather becomes a Disease than a Remedy; for whensoever the blood flows out more often and more abundantly than is fit from the Nostril, if life be not immediately hazarded by reason of too great loss, yet the remaining mass of the blood being impoverished thereby, and losing its temper, acquires a cachectick and frequently an hydropick disposition; even as we have clearly intimated before, where we also have shewn the Ætiologie of this distemper in common with other too great Hemorrhagies, either to consist in the fault of the blood, or of the vessels, or of both together.

First, the blood bringing an Hemorrhage of it self, offends either in Quantity or Quality; and therefore while occasionally it boyls up, it cannot be contained within the vessels, but either opening their mouths by distending them, or unlocking them by its acrimony, it skips out: To which happens that the blood being sometimes dissolved in its consistence, and as it were infected, becomes unfit to continue the course of Circulation, inasmuch as portions thereof separating from one another, are partly fixed in the flesh or skin, having suffer'd death; and partly breaking out, stirre up frequently dreadful, and sometimes mortal Hemorrhagies, as every where is discovered in malignant Feavers, and sometimes in the Scurvy. Notwithstanding the blood offending by meer Quantity or Acrimony, unless the fault of the Vessels happening thereon provoke the flux thereof, or too easily permit it, seldom breaks out into a great Hemorrhage.

Therefore secondly, the vessels bringing blood, as often as they conspire to produce that affection, are usually in the fault, either first inasmuch as their small mouths gaping, by reason of the fibres being too loose and weak, do not readily enough transvafate the blood out of the Arteries into the Veins; which fault happens to scorbutick and cachectical persons; or secondly inasmuch as by reason of the same moving fibres being affected with the Cramp and Convulsion, the blood being snatcht impetuously to and fro, and chiefly towards the Head, is constrained to break out to continue the thread of circulation, even as it will plainly appear in the case of a Patient which shall be shewn below.

1. As to the Prognosticks, although an immoderate flux of Blood, in the Small-Pox, Measles, malignant Feavers, and in the Plague, doth ever preface evil, and is expedient to be stopt; notwithstanding it ought to be restrained not by meer cooling or revulsory things, but to be chang'd by temperate Hydroticks into sweating.

2. An Hemorrhage of the Nostrils, though not great, is more dangerous in Cachecticks with a weak Pulse, and a cold sweat, than a plentiful Hemorrhage in men endued with a Pulse strong enough, and blood very fervent.

3. They who are obnoxious to this Disease, by reason of a Dyscrasie of blood and looseness of the vessels, if there come upon both these a convulsive disposition of the fibres of the little Arteries, they receive a far more difficult Cure, and frequently are reduced to extream languishings by reason of the great losses of blood.

4. From those who are feaverish, when much blood shall flow out of the Nostrils, and does not terminate the disease, often-times in the place of a Crisis a delirous or a soporiferous affection succeeds. There are many other prognosticks about a Hemorrhage accurately remarkt by Hippocrates, which notwithstanding properly belonging to the discourse of a Fever, we omit in this place; for truly, the Cure in general of this Distemper is here almost only intended.

About which there will be three primary Indications, to wit, *Curatory*, *Vital*, and *Preservatory*; the two former respect immediately the symptom to be stopt, as often as it shall be urgent; and the last is busie about removing the Cause of the Disease, that

that so the assaults of the Hemorrhage may be small, or not at all. Besides, an Hemorrhage ought to be handled one way without a Fever, and after a different manner if pressed with a Fever.

Therefore whensoever without a fever much blood shall flow out of the Nose, presently as there shall be need of stopping Remedies, there will be three chief intentions of Curing, all being together assumed into practice, *viz.* Let the turgescency of blood be bridled, that it may be less disposed into inordinate tendencies. Moreover in like manner let it be endeavoured, that as well its fluxion being withdrawn from the Nostrils may be diverted to another place, as that the mouths of the Vessels gaping within the Nostrils be shut: for which purpose Remedies as well external as internal very many and of diverse kinds are wont to be exhibited; of the former we will entreat in order briefly.

The Curatory Indication suggests three intentions of healing.

First therefore let the Patient be quiet, plac'd with his head upright, then let many of the Joints of his Arms and Thighs, but not all, be bound with strait Ligatures, which ought now and then to be loosened and removed to other parts; for all being bound together and long, by reason of the blood being held in the outward parts, and too much detained from the heart, hath caused most dreadful swoonings; but otherwise this Remedy being prudently administred, frequently helps. For when the blood by this means running into the members by the Arteries, is stopt, that it presently returns not by the veins, its more impetuous spreading it self into the head is impeded. Moreover, by the painfull Ligatures of the Joints, the muscular Fibres of the Carotides Arteries are preserved from Cramps which oftentimes come upon them.

Outward remedies to stop the flux of blood.

1. *Ligatures.*

Secondly, For diverting the tendency of blood from the Nostrils, it is sometimes expedient to breath a Vein in the Arm or in the Foot. For by how much more blood is carried by the Arteries to the vein cut, by so much less will the afflux be towards the Nostrils. Yet this administration does not always so help, but sometimes a contrary effect thereof happens, as we have already observed in spitting blood. The reason whereof is, that the vessels being suddenly and not sufficiently emptied, suck up again the disagreeable humours formerly ejected, and stagnating within the pores, whereby the blood incontinently is stirred up into a greater eruptive turgescency.

2. *Bleedings.*

Thirdly, Cold things applyed to the Forehead and Temples, also to the Nape of the Neck, where the vertebral Arteries ascend, cause the vessels to be bound together, and the flux of blood to be somewhat stopt or repelled. Notwithstanding it is ill which some advise, that cooling Topicks be applyed to the Jugular Veins; for so the blood being retarded in its recourse, flows the more plentifully out of the Nostrils. Moreover, what is usual, to apply linty Cloaths, or a Sponge moistened with Vinegar, to the Pubes and Testicles, helps by no other means than the ligature of the members, to wit, inasmuch as the flowing back of the venous Blood is impeded. A sudden and unexpected sprinkling of cold water on the face, frequently stops an Hemorrhage, inasmuch as it gives an impression of terror.

3. *Application of cold things.*

Fourthly, Cupping-glasses applyed upon the Hypochondres, Flanches, inner part of the Thighs, and the soles of the feet, are accounted a famous remedy as well with the ancient, as with modern Physitians, for diverting a tendency of the blood from the Nostrils. And the reason is plain, *viz.* because a Cupping-glass being put on, the impulse of air being prohibited by the space of the orifice, and encreased every where about, presently the blood and humours, yea and vapours, and solid parts, being call'd from any other tendency, are driven towards the empty space of the Glass.

4. *Cupping-glasses.*

Fifthly, Rubbing of the extreame parts are commended in this distemper by some Practitioners, which we judge not always useful, nay scarce safe; because, although they solicit a greater appulse of the blood to the feet or hands, yet they so hasten the return thereof, that the whole mass of blood being raised into an effervescence, it hazards a more violent tendency towards the Nostrils.

5. *Frictions.*

Sixthly, *Zacutus Lusitanus* among his revulsory Remedies, propounds an actual Caustery to be applyed to the sole of either foot; and *Crato* the bending the little finger of the same side, which because done with no trouble we may try; but we advise not so of the former, unless the way of helping were more certain, which might compensate the pain and lameness that would ensue thereon.

6. *Causteries.*

Seventhly, Swooning raised by any means, presently stops an Hemorrhage, however

7. *Faintings.*

ever contumacious it be; wherefore when such bleeding persons are taken out of their beds, or when they do timorously admit of Phlebotomie, though but sparingly, or have their members bound for a longer time, or are suddenly affrighted with some feigned rumour, or by some other occasion fall into a swooning or fainting of the spirits, the flux of blood ceases thereon presently. The reason whereof is evident enough, for that as soon as the motion of the heart fails, presently the blood and spirits rush thither, and so every outward flux is stopt on a sudden, and what was immoderate before, doth not again return.

Remedies by
Sympathy and
Antipathy.

1. Sympathetick-powder.
2. Young Ash-wood.

3. A dry Toad.

4. A Blood-stone.
5. Moss.

Topicks closing
the mouths of
the Vessels.

6. Escharoticks.
The injection of
Vitriol water.

10. Pledgets.

Eighthly, In the last place, for repressing the flux of blood from the Nostrils, Remedies ought to be recited, which are said to operate after an occult manner, by Sympathy or Antipathy, of which sort first is the sympathetick powder, made of Roman Vitriol calcin'd to a whiteness by the Summer Sun; also a piece of wood cut from a young Ash first sprouting about the time the Sun enters *Taurus*; the efficacy of which remedy in the late Civil Wars many worthy of credit attest to have been approved for stopping the Hemorrhages of wounded Souldiers: Yea some still with much confidence prescribe it in all eruptions of blood. I confess the reasons of effects of this kind are concealed from me, if so be they happen often. Besides, it seems not a less Empirical and irrational Remedy, that a silk Bag with a dry Toad in it, worn on the pit of the Stomach, stops any kind of Hemorrhage, and prevents its return: unless (according to the Aetiology of *Helmontius*) that the application terrifying the *Archæus*, compels the blood being astonish'd, either to go back, or desist from its inordinate excursion.

There remain very many famous Medicines whose Operations are wont to be referred to hidden Causes and secret vertue; as are Necklaces of Blood-stone hung about the Neck, also the moss of a humane Skull carried in the hand; Epithemes of the leaves of Nettles bruised and applyed to the soles of the feet, and the Palms of the hands; the Empirical administrations of which kind, when they may be administered without trouble or cost, we make no refusal of; since in a dangerous case every thing is to be attempted; and applications of that sort do help sometimes in respect that they fortifie the imagination of the patient.

While such like outward Administrations are used, for repressing or calling aside the flux of blood out of the Nostrils, also other Topicks are put up into the Nostrils, which may shut the gaping mouths of the vessels, for which use the injections of liquid things, Pledgets, Powders to be blown in, and Fumes are wont to be prescribed, which not helping, in the last place we descend to Escharoticks.

Ninthly, Among Liquids, not only first, but as good as all others is esteemed the solution of Vitriol in Fountain-water. Some boast this for a great secret, and a most certain Remedy. Indeed the same being applyed to a fresh wound, so far as it shuts the ends of the cut vessels, by wrinkling them up, it restrains and presently stops the flux of blood. But that application in Hemorrhages of the Nostrils, where the blood being brought to the gaping mouths of the little Arteries, ought to be received by the Veins, in regard it shuts them as well or rather than those, it succeeds little, and sometimes not at all, as I have known it frequently experimented. This Medicine is prepared of Green Vitriol, viz. of *Hungary*, or of our Countrey, also of the fictitious Vitriol of *Mars* dissolved in a sufficient quantity of Spring-water. I know some commend the solution of Roman Vitriol, which they not only apply by injection, but also to a linnen cloath dipt in the blood are wont to administer it sympathetically. Moreover the water of the infusion of white Vitriol prepared with Bole and Camphire, I have known to be used successfully as well in wounds, as often in other Hemorrhagies.

Tenthly, Since water cast into the Nostrils, doth not adhere enough to the mouths of the Vessels, but is washed away by the breaking out of the blood, before it can exert its Virtue, it is therefore more expedient either that a Styptick powder be blown in, or that a Pledget dipt in the water of Vitriol, either by it self, or strewed with an astringent powder, be thrust into the upper part of the Nostril. For this purpose many and several kinds of styptick powders have been prescribed, I have frequently used either *Crocus Martis* calcin'd to the highest redness, or the powder of Camphorated Vitriol, or the vitriolic Soot scrap'd from the bottom of an old Brass Pot, the powder whereof I have often used with success in this case. In obstinate Hemorrhagies not yielding to other remedies, let Pledgets, whose tops are dipt in Caulstick Colcothar, be put up deep into the Nostrils, that the mouths of the Vessels being

being burnt, and covered with an Eschar, all flux of blood may be presently stopt. Many other Errhines to stop bleeding are accounted famous with Practitioners, as *Hogs-dung*. Hogs-dung, thrust into the Nostrils, which by the meer ill favour is thought to repel the blood; also the smoak of Blood dropping on hot Iron, repercuss'd into the Nose, the Powder being burnt is also taken inwardly. The moss of a humane Skull unburied, put into the Nostrils, is commended by many for this effect: but these latter applications ought to be referred to the sympathetick Ætiologie, if they avail any thing. *Burnt Blood.*

These things concerning outward Remedies stopping blood, the vertue and efficacy of which ought at the same time to be promoted by intern Remedies, seasonably exhibited and cooperating.

Therefore a slender Diet being instituted, and the Patient ordered to keep himself in an upright posture, or not much supine, while the aforesaid Administrations are orderly administred, medicines appropriated to the same end are also prescribed to be taken inwardly. There will be two scopes of Remedies of this sort, viz. 1. That the effervescency of Blood whether incentive or fermentative being suppressed, the liquor thereof being restrained within the vessels, may pleasingly circulate. 2. That the more impetuous motion of the heart driving about the blood too rapidly, may be depressed by apt Sufflaminas. *Inward Remedies, whereof are two intentions.*

1. The first Intention requires Medicines that suppress the too much kindling of the blood, and appease the undue fermentation thereof, for which intents I usually prescribe the ensuing Remedies. *1. Things appeasing the effervescency of the blood.*

Take of the water of Plantane, red Poppy, Parslain, and frog-Spawn, of each four ounces, Syrup of water-Lillies two ounces, Sal Prunella one dram, mix them for a Julep. the dose three ounces three or four times a day. *Juleps.*

Take Barly-water two pound, Red-rose leaves one handfull, Spirit of Vitriol what suffices to make it gratefull, or about half a dram, make an Infusion warm for extracting the Tincture, adde Syrup of St. John's-wort two ounces: the dose three or four ounces, as oft as they please day or night. *Tinctures.*

Take leaves of stinging Nettles, of Plantane, of each three handfulls, pour upon them being bruised Plantane-water 6 ounces, press them strongly, let the strained liquor be taken.

2. For the second Intention, to wit, for the cooling of the heart too vehemently beating, Hypnoticks and Opiates are convenient. *2. Intention, to cool the motion of the Heart,*

Take water of red Poppies three ounces, Syrup of Diacodium half an ounce, make a draught to take at night. Or, *Is done by Hypnoticks.*

Take Conserve of red Roses an ounce and a half, Powder of Henbane, and white Poppy-seeds of each two drams, Syrup of Poppyes, enough to make an Opiate. The dose the quantity of a Nutmeg every six or eight hours.

Take of Laudanum Cydoniatum one dram, the dose fifteen drops twice a day in a convenient Vehicle.

These things touching an immoderate Hemorrhage, and the Remedies thereof, when it happens without a Feaver: but that which coming in a feaver ought to be stopt in regard of the too great loss of Blood, is either Critical making an immoderate excursion, by reason of some accident, for which the Method and Medicines even now prescribed with caution and respect had to the Feaver may be accommodated; or merely Symptomatical, which being excited in a malignant and Spotted Feaver, Small-pox, Measles, or the Plague, neither scarcely can, nor ought to be stopt with the Remedies above recited. For letting of blood is not convenient, repelling Topicks, also cooling Juleps, or Decoctions, and Narcoticks, have no place here: The chief intention of Healing will be to change the Hemorrhage into Sweating, for a gentle Sweat being raised, the flux of Blood often ceases, if it be not very dangerous. *Of a Hemorrhage in a malignant Feaver.*

Take water of Meadow-sweet, Tormentil, of each four ounces, Saxons cool Cordial Remedies two ounces, Treacle-water an ounce and a half, Acetum Bozoardicum three drams, Syrup of Coral an ounce and a half, Confection of Hyacinths two drams, make a Julep, the dose six spoonfulls, every third hour.

Take of the Powder of Toads prepared half a dram, Camphire two grains, take it every sixth hour, with the forementioned Fulep. Or,

Take Powder of Scarlet-cloth from half a dram to two Scruples, as before.

Take Confection of Hyacinths three drams, Powder of Scarlet-cloth one dram, Syrup of Corals enough to make a Confection; the dose the quantity of a Nutmeg every other hour.

Take of Bistort and Tormentil-roots, of each one ounce, the leaves of Meadowsweet, Pimpernel, Wood-sorrel, of each one handful, burnt Harts-horn two drams, Shavings of Ivory and Hart-horn, of each two drams, boyl them in Spring-water from three pound to two, adding about the end Conserve of red Roses three ounces; the dose three ounces being strained, often in a day.

Second Indication vital.

The Position of the Sick.

Sometimes in bed, and sometimes out.

2. Hitherto of the first Indication Curatory, together with the scopes of healing, and forms of Remedies, appointed for a Hemorrhage of the Nose happening with or without a fever. The second Indication Vital only prescribes a slender Diet, temperate Cordials, and a fit handling of the Patient. The Provision of the first is so small and easie, that there seems no need to appoint a Measure and Rules for it particularly. About the latter the chief question is, whether we ought to retain them within or out of their beds. Without doubt the languishing, and those obnoxious to often swoonings, are not to be roused up, unless (as we have already hinted) it be for a Curatory attempt: as to others less weak, it seems so to be determined. Those whose Blood does not easily transpire by reason of the constipation of the pores, and is incited into a greater turgescence from the heat of the bed, and proner to break out, it will be expedient they not only remain out of bed while bleeding, but also sometimes through extern applications to be cooled in the whole habit of their body, or at least in most of their members. Wherefore, *Fabritius Hildanus* relates he suddenly cured one of a great Hemorrhage of the Nostrils, after many things tryed in vain, by putting him into a vessel of cold water. Also with like success *Riverius* cured another affected in like manner, being taken out of his bed, and laid on a woollen Matte on the Pavement, he bathed his whole body with Linnen dipt in Oxycrate. Yet this method is not alike convenient for all persons, or at all seasons; but on the contrary, those whose blood is halituous, and enjoying more open pores, doth evaporate easily, and being wont to be dissolved by a more moderate heat encompassing them, into sweat, and from thence find themselves more quiet, it is more convenient that they remain within the bed, not only while the blood breaks out, but as long as there is danger of its return. For this reason it is, that many obnoxious to dreadful Hemorrhagies, during the Summer, when they transpire more freely, live exempt from that disease, but the Winter cold pressing them, by reason of their pores being bound up, they suffer under more frequent and dreadful Invasions.

Third Indication Preservatory hath two intentions of healing.

3. The third Indication Preservatory, which regarding the removing the Cause of that disease, either stops the eruptions of blood, or renders the same more rare, or less, and suggests these two Intentions of healing, viz. 1. That the blood being restored to its due temperament and mixture, may quietly circulate within the vessels, without turgescency and breaking out. 2. That the Vessels carrying Blood, as to the structure of their little mouths, and the tenours of the muscular fibres, may be contained in their due state; so that they neither cause those inordinate tendencies of blood towards the Head, nor suffer effluxes out of the nose: For both these ends too great plenty and impurity of the Blood are carefully to be provided against by Phlebotomy and Purgation seasonably used; afterwards for procuring and conserving its good temperature, the following Alteratives may be given at fit seasons of healing.

Forms of Remedies.

Take of Conserve of red Roses, of Hipps, an. three ounces, powder of all the Sanders an. half a dram, Coral prepared one dram, of the reddest Crocus Martis two drams, Sal Prunella four Scruples, with Syrup of Coral, make an Electuary, take the quantity of a Chestnut early in the morning and at night, by it self, or drinking after it three ounces of the following water.

Take the tops of Cypress, Tamaris, an. eight handfuls, St. Johns-wort, Tamarisk, Horsetail an. four handfuls, of all the Sanders bruised an. one ounce, of the Crum of Whitebread two pound, slice them small, and pour on them of new milk eight pound, distill

in a cold Still, sweeten each dose when taken with Syrup of the juice of Plantane.

Take leaves of Plantane, Brooklime, stinging Nettles, of each four handfuls, to them bruised pour half a pound of the foregoing water, of small Cinnamon-water two ounces, press them strong, the dose three ounces to four, at Nine in the Morning, and at Five in the Afternoon.

Medicines of this sort are taken in Spring and Autumn for twenty or thirty dayes, with sometimes a gentle Purge coming between. In Summer let them drink Mineral Steel-waters for a Month, than which in this case there is not a better Remedy. Out of many Examples of persons labouring with an Hemorrhage, we only propose this one singular case.

I was lately consulted at a distance for a certain Gentleman that had suffered frequent and great eruptions of blood, one while at the Nostrils, another while at the Hemorrhoid Vessels. He had frequently used Phlebotomy by perswasion of his friends, without benefit; yea frequently falling into cold Sweats and Swoonings after breathing a vein, and notwithstanding obnoxious to eruptions of blood, he was wont to be much worse. I prescribed Juleps (having not yet seen him) and cooling Decoctions, and Anodynes, also the juicy expressions of herbs, and other things cooling the blood, but even from these, (as if all still far enough from the scope) he was nothing the better. At length being sent for into the Countrey to visit him, I found the affection under which he suffered to be meerly or chiefly convulsive; for whereas he daily bled, his Pulse was weak, the extreme parts cold, and all his Vessels as being too much emptied fell flat; also the patient was affected with a continual Vertigo and trembling of heart, and by and by with a swooning or fear of it. Really the blood was so far from breaking out by reason of turgescence, that rather the stream thereof being depressed and small, it seemed scarce enough to sustain the current of Circulation. Notwithstanding the truth of the matter was, he was often sensible of something in his body creeping one while upward, another while downward like wind, and for the most part the flux of blood out of his Nostrils or Hemorrhoids, followed the tendency of that motion: hence it was easie to conclude, that the moving fibres of the Vessels carrying blood, by which they are contracted, being affected with a Convulsion, did disorderly convey the stream of blood however small and low, to and fro, and so compell it into Eruptions: which also happen'd the easier, inasmuch as the mouths of the vessels being lax and gaping, suffered the blood forc'd into them to flow out without any due resistance. The instituted method of Curing did plainly approve of this Aetiology, inasmuch as it happily succeeded, leaning on this supposition; for Blood-letting, and the use of Medicines stopping blood being at last omitted, I prescribed the use of the ensuing Powder, a dose whereof he took every sixth hour with a fitting Julep.

Take the powder of male Pæonie, red Coral, Pearles, of each one dram, Ivory, Crab-eyes, Blood-stone of each half a dram, Lapis Prunella one dram, make a Powder, the dose half a dram.

Take of Black-cherrie water eight ounces, Balm, Barly Cinnamon-water, of each two ounces, Treacle-water one ounce, Syrup of Coral an ounce and a half.

But I commanded that Ligatures should be applied to certain places by a constant course, and by and by to other places as occasion should be given, as well to stop as to intercept the Convulsions of the Vessels; and by remedies of this kind, and means of administration, he recovered his health in a short space, without any return of the disease.

SECT. III. CHAP. III.

Of Vesicatories.

OF losing Blood by Phlebotomy, whensoever it is troublesome and injurious, and swells too much, and tumultuates within the vessels; also of retaining it by Medicines stopping Blood, as often as being outrageous it rages too much of its own accord and flows out, we have hitherto largely discoursed. There remain other certain humours, viz. Nervous and Nutritious, as also Serous, and other recementitious ones which are wont to flow within the Brain and Nerves, and as well in the nervous fibres, as the fleshy, yea and within the Pores of the skin and of the solid parts, which being often depraved or hindered in motion, require emission, being otherwise about to raise great troubles or pains, and frequently dangerous Diseases. Wherefore, that we may seasonably rencounter distempers that are about to rise or take their origin from thence, Physick hath found out certain other Emissaries, mediately or immediately deriving the forecited humours out of the parts and places where they shall offend. And those are either continual, viz. Fontinels of diverse kinds, which are as it were perpetual Drains, and pour out continually the Ichor; or they are temporary, when as occasion requires, the Scarf-skin being taken away in some part of the body, the extremities of the vessels in the skin are made naked, and withall so provok'd, that they spue out in great abundance the serous humours of a various descent and disposition, and so continue to evacuate the same for some time, one while longer, another while shorter. But such a manner of drawing out the serous humours from the outward superficies of the body or any part thereof, is wont to be procured by Medicines called by the Ancients *Phenigms*, or *Sinapismus*, by Moderns *Vesicatories*; of which in the first place we will treat here, (because the knowledge of these leads the way to the Doctrine of Fontinels) and we will chiefly insist on unfolding these three things; viz. First, It shall be shewn, from what Bodies, and after what manner disposed, Vesicatories are wont to be prepared. Secondly, Whereas they are of diverse kinds, it shall be declared what is the manner and reason of their operation in every one, or at least in the chief of them: Thirdly and lastly, we will make search for the curing of what sort of Distempers they ought to be appointed, and in what places applyed.

Vesicatories anciently called Phenigms and Sinapisms.

1. Of what prepared.

1. From actual Fire, or things imbued with it.

2. From things potentially burning.

1. As to the first, the most simple Blisterers are either Fire, or solid Bodies, or Liquors endued with fiery particles; (which are seldome administred for this use by reason of the terror which they impress, and the imminent danger, lest being more strongly apply'd, they do not only blister the Scarf-skin, but burn the skin and other parts.) Let therefore what is safer and less dreadfull, Epithemes out of Concretes having more sharp and (as as is affirmed) potentially fiery particles, be applyed to the places to be blistered, which are either milder, and by the Ancients were call'd *Phenigms*, because they made the part red, the Scarf-skin taken away; or were call'd *Sinapisms* in respect of the matter, and were wont to be prepared of Mustard, Pidgeons-dung, Squills masht, Garlick, Milk of Figs, and the like; or they were stronger, and consisted of *Euphorbium*, *Cantharides*, *Flammula Jovis*, Crows-foot, greater Plantane, with many others, which being endued with a certain burning and caustick quality, are used outwardly for the use above recited, but taken internally, they prove venomous and frequently mortal.

The Composition and forms of things drawing blisters are reported to be manifold and of sundry kinds, although one or two may here suffice, and by how much the more simple, the better; and in most cases for the most part 'tis all one which you use: notwithstanding we shall after our manner annex some select Prescriptions of these kinds of Remedies. And that we may say little of *Dropaces*, *Sinapisms*, and *Phenigms*, whose use is almost exploded; almost all Vesicatories now in use have *Cantharides* for their Basis.

Forms of Vesicatories.

Take powder of *Cantharides* half a dram, to a dram, powder of *Ameos-seeds* one scruple, of old Leaven kneaded with Vinegar, enough to make a Plaster, spread some of it on Leather,

Leather, apply it twelve hours to the place to be blistered. This works certainly and strong enough: but because it is less compact and sticking, and may fall from the place to which it is put, or is apt to crumble, therefore for the more commodious application, this following is very convenient, and now in use with most.

Take of Cantharides three drams, Euphorbium half a dram, powder of Ameos-seeds one dram, let be incorporated with Melilote-Plaster by a warm hand, as much of this powder as it is capable to receive, then spread it on Leather, and apply it for twelve or sixteen hours.

Some do use to incorporate the foregoing powder with Burgundy Pitch, and spread it upon Leather, afterwards to cover the sides with red Sanders incorporated with Burgundy Pitch, and so administer both a Dropace and a Vesicatory. Also by applying still the same Plaster, the Scarf-skin being blister'd and taken off, and the place being red, and ulcerated, and only wiping it once or twice in a day, and putting it on again, they cause the little Ulcer raised by the Vesicatory, to flow at pleasure, yea sometimes above a month, and to throw off a plentiful Ichor.

A more delicate Vesicatory with a Dropace.

Others inclose Cantharides bruised, and sprinkled with Vinegar in Silk, and apply to the place.

Some Empiricks use in the room of Cantharides a mass of the leaves of Crow-foot, or *flamula Jovis* bruised on the place, by which the Scarf-skin being blistered, or rather eaten, the skin it self, as if toucht with an actual fire, is much inflam'd and deeply ulcerated; whence not only a profusion of Ichor but an inflammation of the whole member, and a feverish disposition sometimes follow: wherefore these things are not to be used rashly.

2. If it be enquired of the manner and reason how these and other Vesicatories operate: in the first place we ought to shew by what manner actual Fires, and things endued with particles proceeding from Fire, do raise a blister; then by an easie Analogy the force and manner of working of those sorts of remedies will be known, which are reported to be endowed with a potential fire. Wherefore we observe of the former, that the fiery particles not being too vehemently applyed, penetrating the Scarf-skin without dissolution of unity, enter under the skin it self, where the extremities of the vessels bringing blood, of the Nerves, and of the nervous Fibres are terminated; and there do variously twist together these, altering them from their position, and pervert the structure of the whole texture of the skin: inasmuch that from all the vessels being made angry in a high degree, the watery humour being imbued with igneous particles, and therefore rejected, as well by the blood as by the nervous Juice, is spued out in great abundance: This Lympha, because it cannot pass through the Scarf-skin, separates it from the skin, and raises it into a bladdery bulk, from which at length being broke of its own accord, or occasionally, it flows out. Moreover as long as the igneous particles adhere to the skin, and the mouths of the Vessels, being covered with an Eschar, are not closed up, these being continually twitched by them, do continue to spue out the Ichor. This kind of ichorous flux will the sooner cease, if immediately upon the hurt inflicted, the fiery particles be drawn out, by the application of some proper Antipyretick, as Fire it self, Nitre, Soap, Onions, and the like. Moreover it runs the longer, if omitting an Antipyretick, medicines hindering the generation of a Cicatrice, or of the outer-skin, and unlocking the mouths of the vessels, be worn upon the place affected.

2. How they operate.

Shewed by the example of Fire.

By these it is easie to understand by what manner Vesicatories perform their operation, viz. Cantharides (as likewise any other of the same vertue) being outwardly applyed, and being heated by Effluvia's of the parts subjected, and so being provok'd to exert their power, do plentifully dispatch sharp and as it were fiery particles from themselves, which penetrating the Scarf-skin without any tearing it, they are dashed against the *Cutis* or other skin, where first they act upon the Spirits, and then by the affecting these, upon the Humours and solid parts. They very much provoke the Spirits, and drive them into painful Convulsions of the fibres, dissolve the Humours, and constrain them to separate into parts, so that the watery part being very much embued with those sharp, and as it were venomous particles, is rejected every where by the other Juice; and when in the mean time the ends of the Vessels and Fibres are either eaten by the burning, or opened by twitching, and as it were drained, that Ichor conveying the hurtful particles is plentifully spued out of their little mouths; which then separates the impervious *Cuticula* or the Scarf-skin, from the other

How Cantharides excite Blisters and draw forth water.

other skin or *Cutis* it self, and raises it into a little bladder, and after this being broken and taken away, it is for some time poured out by the ulcerated skin (as we shewed it to come to pass by reason of the particles of fire.)

why they bring
a fervent Dysu-
ria.

But this is not only done, because the serous Juice imbibing the sharp parts of the Medicine, and conveying them out, doth not always bear them all back the same way by which they entred, but sometimes this being endued with these stings, regurgitates into the mass of Blood; and afterwards being circulated with it, and ejected with its infestous burden through other Emunctories, offends some weak or tenderer Channels in its passage or going forth; from whence very many contract a Strangury, from great or many Veficatories, by reason of the urinary passages being affected for that cause with Acrimony or Erosion, which in some becomes most sharp and intolerable. Also that application sometimes brings bloody Urines to others afflicted with the Stone; hence a suspicion also arises, that those who have tender Lungs, or who are subject to a Consumption, are much endangered by this Medicine outwardly applied; which notwithstanding I have not known happen to any; but can rather attest by frequent experience on the other side, that it redounds to advantage rather than hurt. For the more sharp particles of Cantharides, if they be long applied, being sometimes imbibed more plentifully by the blood, infect its whole Serum: which Juice so sharpened, as long as it is confounded with the Balsamick blood, hurts no part; but being separated from it by the Kidneys, it sometimes brings hurt to them, and frequently not only twitches the neck of the Bladder by its Acrimony, but sometimes corroding it, causes filth, and little skins, nay and blood to come away: but in the mass of blood, the same more sharp, saline-volatile particles do often most notably help; inasmuch as they destroy the fixt or acid Salts in it, and unlock the consistence of the blood too much bound up, and so do cause the serous and other morbidic recrements before wrapt up with it, to be separated from it, and to be more easily dispatched by Urine and Sweat; hence Veficatories being applied long in Feavers do call forth plentifull Urine and a more easie Sweat. Also they open the obstructed wayes, and move together the portions of Blood or Serum, stagnating or being extravasated in any place, and restore them to their Circulation. Wherefore they are not used only to help in serous maladies, but also in those of the blood, yea in a Pleurisie, Peripneumonia, and in any other Feavers.

Veficatories
move Sweat
and Urine.

Having hitherto shewed after what manner Veficatories operate first on the Spirits, and then on the Humours and solid parts, it is now our business in the next place to shew both the good and evil effects of them, as also the manners of using them. But that they in the first place operate on the Spirits is manifest from hence, that they exert no power on the deceased, and it is an ill Omen in those that are languishing, when Veficatories have no operation, because it is an Indication that the Animal Spirits are much dejected, or abundantly diminished.

The effects of
Veficatories.

Therefore, it behoves to consider about the due unfolding the energy, force or virtue of this remedy, what humours it either immediately or mediately evacuates or alters; and afterwards in what Diseases, and bodies how disposed it either profits or hurts.

I. As to hu-
mours of the
Skin.

First, As to the former, the humours that are immediately sent out by a Veficatory, drop forth partly from the pores and glandules of the Skin, and partly out of the mouths of the little Arteries, and partly out of the extremities of the Nervous fibres; perhaps some little of the Juice newly received, out of the mouths of the veins, though not much, seems to be carryed back. The humours mediately drawn out by a Veficatory are those which the aforesaid parts being emptied receive elsewhere, and derive them forth.

1. The Skin is a thick Membrane consisting of a double Coat, very porous, also thick set about with most numerous glandules, with fat, as also the ends of the Vessels and fibres being terminated therein, and thickly woven one within another. Wherefore, while a portion of it is made bare, the Scarf-skin being taken off with a Veficatory, and the nervous fibres being twitched, do bind together, and wreath the glandules and pores, the serous humour contained in both, is most plentifully squeezed out. And whereas some pores are pervious into others, the Serum doth not only flow out of the place blister'd, but sometimes into the little holes first so emptied, a portion of the Serum coming from the neighbouring pores succeeds, and thence by and by sweats out: wherefore in Patients affected with an Anasarca, the little
ulcers

ulcers raised by a Vesicatory, exhaust the waters every where in great plenty, and draw them out of the neighbourhood, yea and sometimes at a great distance.

2. The little mouths of the Arteries being uncovered and twitched about the blistered place, do not only vomit out a portion of the Serum brought to them, by ordinary custom, but the serous liquor being imbued with the Stimula of the medicine in the whole mass of blood, immediately is separated more plentifully from the blood; and at every turn of Circulation a greater plenty thereof is thrown out by the same mouths of the Arteries continually irritated: Moreover together with the Serum as it were so stagnating, and therefore removed from the whole blood into the little ulcers of the skin, other recrements and sometimes the morbid matter itself depart in plenty, and are dispatched forth by the same Emissaries; and for this reason in malignant fevers, yea in some putrid, that are difficult to be judged of, when the recrements and corruptions of the blood, unapt to be thrown off, do threaten the Præcordia or Brain, Vesicatories continually and leisurely draining it, do frequently yield notable relief; whereunto we may adde, that they do also alter and restore (as we before mentioned) the blood degenerate or depraved as to its Salts, and also by opening or subtilizing its consistence, dispose it towards an Eucrasie; wherefore, not only in a feverish state of Blood, but also in a state otherwise peccant, or of ill Juice, this kind of remedy is often extremely convenient.

2. In respect of the blood.

which they purge and alter.

3. Both reason and experience have enough proved, that Vesicatories evacuate a certain humour from the Nerves and nervous Fibres, and for that cause profit very much in convulsive distempers: For surely we have in another place clearly enough demonstrated, that the watery liquor of the Brain and Nervous system, doth sometimes abound with heterogeneous Particles. Also it is manifest by frequent and familiar observation, that the impurities and recrements of that liquor, together with the watery Juice, do spontaneously sweat out from the Nerves and nervous Fibres, when the fluor is raised, and either restagnating within the mass of blood, are carried off by Urine or by Sweats, or being deposited within the Cavities of the bowels, are dispatched by Vomit or Stool. Wherefore, when a Vesicatory is applied, the extremities of the Nerves and nervous Fibres being made bare, and very much angered, immediately a humour abounding near their ends is voided; and also the whole Juice planted within their passages by a long succession, is chafed, and delivered from stagnation; and the heterogeneous particles mixt with that nervous Juice, being every where agitated and derived from the Brain, slide towards their newly opened Emissary, by degrees, and at length are removed wholly forth.

3. In respect of the Nerves and of the humours abounding in them and in the nervous parts.

From these things we may collect, for the Cure of what Diseases this kind of remedy doth chiefly conduce; for by reason of its evacuation out of the pores and glands of the skin, as often as any serous, salt, sharp, or otherwise hurtful humour is collected in those parts, or their neighbourhood, and being excluded from the Circulation of blood, shall obstinately stick in that place, surely there is no more ready or easie way afforded for drawing it forth, than by applying a Vesicatory, upon or below the place affected. Wherefore, it is not only indicated by an Anasarca, or by any foulness or eruptions of the Skin, but moreover a Vesicatory is required for pains either arthritical or scorbutical, fixt any where in the extern habit of the body, or in any certain member.

For the curing of what Diseases Vesicatories are convenient.

1. In all cutaneous Distempers.

Secondly, In respect of the Blood, Vesicatories are always used in malignant Fevers, as well to purge out leisurely any heterogeneous or morbid matter, as to change it from a disposition either too acid, or salt, or otherwise peccant, into a right temperament; yea they are of most excellent use in all putrid fevers of ill habit and hard to be judged of. Also for that cause in the Scurvy, Leucophlegmatia, Pica Virginum or Green Sickness, also in any other ill habit of body, this kind of remedy affords frequently notable help. Moreover not only for the sake of correcting the blood itself, but besides as often as it being depraved spreads its corruption on other parts, and so doth first beget diseases in the Head, the Chest, the nether Belly, or Members, and then excites their Fits, Vesicatories are usually exhibited with success. Wherefore it is a common remedy in Head-aches, a Vertigo, and soporiferous affections, no less than in a Catarrh or any defluxion either into the Eyes, Nose, Palate, or Lungs, in which every one without consulting a Physician, will prescribe to themselves Cantharides for Revulsion. I confess, when I have often been surprized with a great Cough, with abundant and thick Spittle (whereto I am originally obnoxious) I have received relief from no other Remedies more than from Vesicatories; wherefore I am wont, while

2. They take away the impurities and ill temperament of the blood.

This Remedy is profitable in those Diseases which the blood produces in other parts.

that distemper doth urge, to apply Medicines drawing blisters first upon the Vertebra's of the Neck, then those little Ulcers being healed, beneath the Ears, and afterwards if need require it upon the Scapula's; for so the serous filth loosened from the consistence of the blood sweating forth, is derived from the Lungs, and also the mixture of the blood sooner recovers its temper, inasmuch as after this manner its enormous salts are destroyed.

3. Also in all Distempers of the Brain and of the nervous Stock.

Thirdly, In respect of the Humour, *Epispastricks*, as they are of most common use, so they are wont to confer great help, in soporiferous, convulsive and painful distempers, for deriving and evacuating it out of the nervous stock and the brain it self. Was ever any surprized with a Lethargy, Apoplexie, or Epilepsie, but that immediately Friends and Attendants however unexpert, have tormented his Hide with the application of Cantharides? In stupendious convulsive motions, ascribed usually to nothing less than Witchcraft, I have applyed Vesicatories with great benefit in many parts of the body at once, and I have continued them above a Month, presently renewing them in fresh places. And also pains that are fixt and most fiercely tormenting in the membranous parts, are seldom cured without this administration. For sometimes morbid humours and Particles which being deeply radicated, yield nothing at all to Purgers or sweating Medicines or Diureticks, yet have seemed to have been pulled up by the roots by Vesicatories, as it were remedies laying violent hands on the disease.

For what Diseases Vesicatories are intended.

But this Remedy although most general is not used to operate so easily and happily in some Diseases and Constitutions; wherefore we may not rashly or indifferently use it towards all persons. For those who are Nephritick and obnoxious to a frequent and painfull Strangury, scarce ever endure the application scot-free; wherefore, on those that are so affected we must not use Vesicatories, unless in malignant Feavers, or acute Cephalick Diseases, for avoiding the greater Evil.

In what Constitutions they agree best.

As to what relates to the various Temperaments and Constitutions of men in respect of which Vesicatories are used to be more or less convenient or advantageous: Concerning these, this threefold notable difference occurs. In the first place, some persons for the most part endure well the use of this Medicine, and the little Ulcers raised thereby in the skin, sweat out an Ichor sufficiently plentiful without any Dysurie, or great Inflammation of the place blistered; and then heal of their own accord; which effect succeeds only in blood of a good temperament, where, to wit, the Salt and Sulphur being moderately and rightly constituted, there is present an abundant plenty of Serum; whose Juice easily and more largely separating from the rest of the blood, carries away the sharper particles of the Medicine imbibed with it self, and partly sweats them out through the place blister'd, and partly conveys them out without prejudice by the Urinary passages; therefore also the advantageous effects now recited are produced in the mass of blood.

Also in whom not.

2. But secondly this remedy with some doth neither well agree, nor operate profitably; because it rubifies the place very much to which it is applyed, or rather excoriates it with most fierce pain and great inflammation; notwithstanding the little ulcers made in the same place, although they do for some time torment the patient, yet pour out very small or scarce any Ichor: Also to these always blister'd with torment, for the most part a violent Strangury happens. The use of these Vesicatories being troublesome and unsuccessfull, doth frequently happen to men of a cholerick and hotter temperament; whose blood is endowed with a plentiful Salt and Sulphur, and a small quantity of Serum, being more thoroughly concocted with the rest. Wherefore, when the Juice that ought to carry away the more sharp particles of the Medicine, doth neither easily nor plentifully pass from the rest of the blood, (that it may speedily wash them out) those particles sticking still in the skin, do as it were infect and impoison the blood it self, passing through, and for that cause being impeded from its circuit, they cause it to stagnate, and to be gathered together about the extremities of the Vessels, whence they are inflamed. Moreover the serous Juice being separated by the Kidneys when of it self it is little and sharp, and besides becomes stinging from the particles of the Medicine, it irritates the Neck of the Bladder, and frequently corrodes it by its acrimony.

In men of a more hot temperament they torment the part and do not draw forth the water.

In others, inasmuch as they draw forth too much Ichor, they are not profitable.

3. There remains a third Case although more rare, relating to blistering, to wit, in whom little Ulcers being raised in the skin, presently pour out the serous humour in so great abundance, that in a little time it will be necessary to give repelling Medicines, and that at the mouths of the Vessels; otherwise, from too much flowing out of waters,

waters, a dissolution of strength, and a fainting of the Spirits are in danger to ensue. This I have known so constantly happen to some Patients, that afterwards I was fain to restrain their use of Cantharides although there was need of them; the reason whereof seems to be, that the blood being endowed with a salt Serum, and more sharp than it ought to be, hath a consistence too easily dissolved: wherefore, that ferous juice being sharp, and fretting of it self, as soon as it is provok'd by the particles of the Medicine loosening the consistence of the Blood too easily dissolved, immediately breaking out with violence from the mass of blood, wheresoever there is a passage afforded, it flows out with a full torrent through the mouths of the vessels gaping in the blistered place. Besides this too much flowing out of the Serum, raised from the first application of the Vesicatory, sometimes happening late in malignant Feavers, and in others ill, or not at all judged, and remaining a good while, wholly consumes the morbidic matter, and delivers the Patient from the jaws of Death. In such a Case after the little Ulcers for the first days have poured out little or a very small quantity of Ichor, at length Nature attempting a Crisis by this way, a vast Illuvies of Serum flows out from the same; and so sometimes for many dayes, nay weeks, continues to flow out, untill the Patient before accounted desperate, recovers his entire Health. Little Ulcers so abundantly flowing, as it is not easie, so it is not safe to stop them before the whole Mine of the Disease be consumed. Not long since, a famous Doctor of Physick in London, scarcely recovering from a malignant Feaver, did copiously sweat out Ichor daily from places blistered in several parts of his body; after some time (they being troublesome and tedious) he did apply stronger Repercussives to them all, and immediately restrained their flux. Those fluxes were scarce two days stopt, but his disease revived, and on the sudden he was affected with fainting of Spirits, and often swooning, a cold Sweat, and a low weak Pulse: and whereas he could not be relieved by any Remedies, however cordial they were, he dyed within three days; the cause of which seems to be, that the malignant matter being suddenly repressed, fell into the Cardiac Nerves, whose action being hindered, the vital function quickly failed.

The Ulcers of Vesicatories do sometimes plentifully flow in Feavers, and give Judgment of the Disease.

They are not to be cured.

An Example is shewn.

SECT. III. CHAP. IV.

Of Fontinels, or Issues.

BESIDES Vesicatories, which being as it were the extemporary Emissaries of the Serum, and other humours externally to be brought forth, are only raised upon some occasions, and then after their efficacy a little shewed, are permitted to be dried up; there are others esteemed as it were continual Fountains, therefore named *Fonticuli* or Issues, out of which the Ichor or ferous humour flows with a constant Spring. Those former, as they are requisite for the most part for Cure-sake in acute or other Diseases, whose morbidic matter requires a quick dispatch, in the first place respect the conjunct cause of the Disease to be removed; and therefore being more broad, are made only superficial, that such little Ulcers being large, may evacuate much, and then easily be healed: but on the other side, Issues being chiefly indicated for preservation, are ordained to remove or vanquish the procatactick cause of the Disease: wherefore they consist of a more narrow orifice, but made more deep through the thickness of the whole skin, to the end, that while they send out the morbidic matter in lesser quantity, they may derive it further, and continue longer to purge it out.

Issues rather a preservatory than curatory Remedy.

There are three chief heads of disquisitions concerning Issues, viz. First, what humours these Emissaries chiefly evacuate, and whence they bring them: Secondly, in what Diseases or Constitutions they better or worse agree: Afterwards Thirdly in what places, in what form, and with what instruments they ought to be made.

About these, three things are to be enquired into.

1. As to the former, Issues, like Blisters, purge out all humours fixt within the skin, (although in a less compass,) or brought through it as well by the sanguiferous, as nervous Vessels, not only as they provoke, or as it were suck the outer superficies of the skin, but by piercing through the whole hide or skin, they convey

1. What humours they evacuate.

out whatsoever flows from the sides of the orifice through the broken Vessels, also whatsoever slides down elsewhere beneath the orifice. Wherefore not only humours accumulated within the pores of the skin, or glandules, or brought thither by the Arteries, or Nerves, have conflux to Issues; but moreover the serous recrements under the skin, that are wont to be transferr'd, or creep between the interspaces of the muscles and membranes from place to place, tend every where unto them and find passage. Moreover an Issue appointed in the way anticipates morbid humours, which were formerly wont to be conveyed to other weak and long afflicted parts, and by such means exempts one while this part, another while that, from their invasion. Hence either a Gouty, or Nephritick, or Colick matter, and sometimes a Paralytical, or otherways scorbutical, are frequently intercepted by Fontinels, in their passage from their Source to their nests or places of residence, and so are conveyed forth, and the usual assaults of a disease declined: Neither doth this Emissary less purge from thence by degrees the humours impacted in any part or region of the body, and there causing prejudice, than water-furrows made for derivation of moisture, and so prevent or cure a sickly disposition.

2. In what diseases they chiefly prevail.

2. From these several accounts of assistance, whereby Issues in general are wont to help, it is easily collected, for what distempers they are chiefly required; for although there is scarce any disease happens, wherein this remedy is either hurtfull or unprofitable, notwithstanding it seems rather more necessary in some cases than in others. It is commonly prescribed for almost every disease of the head, whether outward or inward: Every one of the ordinary people procures an Issue as equal to all other Remedies, for the Convulsions of Infants, or Youths, for Sore-Eyes, Kings-Evil, as also for Head-ache in persons adult or ancient, for drouse, vertiginous or Cramp like distempers. Neither is it less celebrated against diseases of the Breast; As who is obnoxious to a Cough, bloody or consumptive Spitting, or an Asthma that long enjoys his skin whole? In like manner Issues are commended in affects of the lower Belly; scarce any Hypochondriacal person or Hysterical woman, in like manner no Gouty or Cachectical person, but hath his skin pierc'd in many places like a Lamprey. It would be a vast work to recount here particularly all the Distempers for which Fontinels are helpfull.

3. In what Bodies they agree not.

3. But really this remedy, however advantagious and benign of it self, doth not agree with all persons, nor is it indifferently to be prescribed to every one. For there are two sorts of men, which though sick, are to be excused from Issues, inasmuch as this Emissary evacuates too much in some, and too little in others, or less than is convenient; and in the mean while remains very painful and intolerable.

Viz. First where they evacuate too much.

Sometimes a Fontinel is not convenient, because it too much evacuates or consumes the humour or Spirits. For I have observed in some, that an Issue made in any part of the body, pours out an immoderate quantity of Ichor, and peccant in quality: for out of it by often turns, if not continually, a watery, thin and fetid Juice, oftentimes discolouring the Pea and Coverings with blackness, flows out in great abundance, and so the strength and flesh is impaired by too great an Efflux thereof.

why they often pour out the humour too much.

The reason whereof seems to be this, that in some persons endued with an ill disposition of blood and humours, a wound being made and hindred from healing up, degenerates straightways into a filthy and malignant Ulcer; the sides whereof put on the nature of an acid corruptive ferment, whereby the portions of blood continually forced thither, are so tainted and dissolved, that the Serum thereof imbued with the dissolved Sulphur, and other Corruptions, being refused by the Veins, flows out there copiously. Moreover, this putrifying pollution of an Issue being communicated to the blood, depraves in some part the whole mass thereof, and so at least (as also by too much loss of the serous Juice) it is rendered less nutritious: Besides, from the Sulphur of the blood dissolved near the sides of the Issue and flowing out with the Serum, the streaming Ichor doth so stink, and black the Covering. Sometimes an Issue pouring out the Ichor not immoderately, consumes the spirits and strength more than it ought, which really we take cognisance of from the effect, and sometimes not till afterwards; inasmuch as some, while they bear about them one or more Issues, remain feeble and lean; but they being stopt presently become vigorous and more plump. Moreover, it is a common observation, that many from an Issue raised near the head, have been presently surprized with a certain defect, and weakness of sight, inasmuch that they have been constrained immediately to heal it up: which seems to happen

why they expend the Spirits too much.

happen for this cause, for that where the provision of spirits is small, and their consistence very thin, the small losses of them, or of the Juice from whence they are procreated, if so be they are constant, are difficultly endured.

But in another and different respect, Issues like Vesicatories are forbid to some, or very cautiously prescribed, for when they evacuate little or nothing at all, they very much vex the place, where they are made. For in persons endued with a cholerick, or hotter constitution, the masse of blood being thicker than it ought to be, and less diluted with Serum, becomes more bound in its consistence; in these the solution of Continuity being made and kept by reason of the Issue, the blood it self (for that it doth not sufficiently discharge its Serum, whereby it may go away) sticks in the passage, and so being extravasated, causes a very painfull inflammation; and in the mean while, as it pours out little ichor, it remains as well unusefull as troublesome. The operation and uses of Fontinels and their indications being designed, we shall shew in what place, in what form, and with what instruments they ought to be made, and after what sort to be managed.

Issues are likewise inconvenient when they evacuate less than they should doe.

The places are appointed according to the ends or intentions of Curing by them, which chiefly are these three, viz. 1. A general Evacuation of humours from the whole body. 2. An Evacuation and also a revulsion from some particular member. 3. An Evacuation and also a derivation from some particular member. In respect of the first it is expedient that an Issue be made in the left arm; The second Intention requires it far from the part affected, and the Third near the part.

The places of Issues are designed, according as the ends are Evacuation General, or Secondly, Evacuation and Revulsion, or both that and derivation.

For these ends, viz. one while for this, another while that or the other Fontinels are made in all parts of the Body, viz. in the Head, Breast, Abdomen, in the Arms and Thighs, and in most parts of each of these, either by Incision, or Caustery, or piercing through, and in their holes or orifices Pease, or wooden Pease, Pellets or Pledgets, are put to keep them open. We will observe the principal places and kinds of Issues by running through the members of our body.

1. A Fontinel is prescribed by some to be burnt by a Caustery in the Coronal Suture, and is commended for exhausting and evacuating humours out of the brain and its outer Coverings. Although some use this in familiar practice, yet I have found by experience in some it doth less happily succeed, inasmuch that I have ordered many Issues to be stopt that have been made on the top of the head, being instructed herein from Reason and Experience; for that the blood transferres more feculency towards the place where it was wont to lay aside its recrements, and deposits them in the whole vicinage, and chiefly in the part affected, (as being the weaker and more susceptible part) whence a Disease is oftner augmented than cured. For the same reason, viz. for the derivation of the humours from the inner head outwards, some form Issues in the fore-part of the Head over the sagittal Suture, others in the hinder part of the Head about the beginning of the Lamboides, but the same exception remains against both as the former. And doubtless more rightly doth an Issue in the Arm anticipate the morbidick matter that is wont to be deposited about the head, or makes revulsion in the Thigh, and raised a little beneath the head, derives from thence. For this reason in painfull distempers of the brain, and Meninges, we cut a deep hole in the Nape of the Neck in Children and Youths; but for those grown up, and Old men, we apply Causteries on either side the Spine between the Shoulders or the Homoplatas, and in the same places we make incision for two Fontinels capable of many Pease, often with very great success. As to holes cut or burnt behind the Ears, or a Seton with a skane of Silk drawn through the Lobes thereof, I have seen them rarely with any success, but often very troublesome; Inasmuch as a solution of Unity made in these places, neither discharges much Ichor, nor for any long space; for though the hole or orifice be fill'd with a Pease, or Pill, it will be covered in spite of all endeavours to the contrary by the Cuticula, or skin growing under.

1. In the Coronal Suture.

Issues in the fore and hinder part of the head.

Between the Shoulders.

Issues in the back do notably help diseases not only of the Head by Evacuation, and derivation of the morbidick matter, but also in all Gouts, Stone and Colicks, by anticipating the fuel of the Disease, and by intercepting it while it tends to its seats: which really is plainly proved by experiments and observations taken from the help of the Patients.

which are profitable in many diseases.

Fontinels between the Shoulders, also in the Arm or Thigh, conduce to the evacuating or anticipating, in pectoral Diseases, the humours flowing to the Lungs, and to the drawing back those deposited there. How an Issue cut in the Chest between the Ribs doth sometimes more immediately derive the consumptive matter from the Lungs, we have elsewhere shewed.

The

*An Issue in the
left Hypochon-
drium.*

The Region of the Abdomen seems unapt for bearing an Issue in any part thereof; notwithstanding the practice of some, although it be more rare, is much fam'd for a large Issue capable of many Pease to be burnt with a Cautery upon the Region of the Spleen for any hypochondriac affection. I have known it of small benefit to some, at least not recompensing the trouble and pain of such a remedy.

In the Groin.

Some time since I successfully cured a weakness in the Loyns obstinate to all other remedies, by a Fontinel in the Groin, and in another patient an inveterate Sciatica. For surely the glandulous Emunctories settled in that place, do imbibe very many recrements of the blood and nervous Juice; which if they be thoroughly and continually discharg'd from them by a fit vent, it will much conduce to exempt the contiguous parts from any morbifick Mine.

In the Thigh.

The Thigh being a member soft and large in bulk, seems apt enough for enduring many and great Issues, to wit, those which may purge away plentiful humours from the whole body. Yet it doth not succeed so with many patients, partly because of its figure too much declining, like a Cone invers'd, the Ligature containing the Pease in the orifice is not easily kept on, and partly because a solution of the Unity being made among the concurrence of so many Tendons, it frequently becomes inflamed and painful; infomuch that sometimes it hath been necessary that it should immediately be stopt up, to withdraw the trouble of pain and of lameness. Notwithstanding it succeeds better in some Patients, for that an inflammation doth not always ensue upon the place where the incision was made, and that the Ligature has remained immovable to those that tie their hose above the knee.

*A fit place in
the member to
be chosen that it
may be made
far from Vessels
and Tendons.*

Moreover, as concerning Issues, it is requisite to choose a convenient place not only in the body, but also in the very member where incision is made, which chiefly calls for the judgement of an expert Physician or Chirurgion; for carefull provision must be made, lest a Cautery or incision be made upon, or too near the Tendons or greater Vessels; but let the Fontinel be made not in the very body of the muscle, but in the interspace or distance between the muscles; where the orifice, as *John Heurnius* learnedly observes, ought to pass through the whole skin so far, untill the little membrane of the muscle underneath be penetrated. Wherefore, this part of Chirurgery is not rashly to be allowed to Quacks and others ignorant of Anatomy, for that from this being ill done, not only a frustration of the benefit, but from thence frequently great mischief happens, and sometimes to the hazard of life.

*Symptoms acci-
dental to Issues
how to be cured.*

It is not needfull to describe the figure and use of the cutting Instrument, together with the manner of preparing and compounding Causticks for making Issues, inasmuch as it is notorious to the common people; yet it behoves us to handle in what manner the symptoms which happen to these Emisseries after they are made, may be cured, and it will not be besides the matter to discourse, what do either impede or pervert their powers.

*What chiefly re-
quire help.*

Whereas many and several distempers happen to Issues, help is not required for them all, but only for such as are of greatest moment: Wherefore there will be need of help, 1. Wheresoever an inflammation ensues upon the part or place where it is. 2. If the Orifice vent more or less Ichor than it ought. 3. If the Ulcer shall be apt spontaneously to be dried up, and cover'd over with a skin: or if it be prone to abound with spongyous flesh growing about the sides. As to lesser faults, as when the Ulcer shall break forth into frequent Hæmorrhagies, or change its place creeping into another less convenient, with many other ways by which it prevaricates, it will not be worth our labour to discourse here.

*1. Inflamma-
tion.*

1. An inflammation frequently happens to an issue, and that so painful sometimes, that it threatens a Sphacela, yea and sometimes causes one. But such an affection ensues either upon the orifice new made, or happens afterwards by reason of the blood and humours, occasionally agitated and rushing frequently and in heaps to that part.

*Which happens
to a new Issue,
the Reason of it
and Cure pro-
posed.*

When a Fontinel is made, immediately by reason of solution of the Unity, and consequently by reason of the circuit of blood somewhat hindred in that place, a certain inflammation and ulcerous pain happens to some patients; but in some endued with a fervent blood, and whose Serum is less diluted, this ensues much fiercer. For the blood being brought thither by the Arteries, the ends of the Vessels being cut off and obstructed, it can neither go out nor be returned immediately by the Veins, but sticking there in the passage it is accumulated more and more, and being at length extravasated, and filling and stopping all the pores of the contiguous skin and flesh,

flesh, it raises a tumour with redness, and heat most intense, which coming to pass, either the blood so heaped up, and extravasated, in a short space of time becomes immovable by reason of constipation, and for that cause being as it were divided from the rest of the mass, it is extinguished, and suffering death produces a Sphacela upon the part: Or secondly, the blood so stagnating, is after a sort agitated as to its particles, and enjoying alwayes a vital flame, and made more intense by the same, it is as it were boyled throughly, and so is changed into a Pus, to be evacuated by an abscess: Or, thirdly, which happens more frequently, and ought always to be procured in our case, the blood provoking an inflammation is reduced into the Vessels and restored to Circulation by other passages whereinto it is constrained.

An Inflammation hath three manner of Crisis's.

But that it may be reduced, these two things will be necessarily requisite: First, That it be much diluted with the Serum flowing thither abundantly, or rather thrust forward into the part: Then secondly, that the Vessels behind the Tumour being emptied, may swallow up the blood diluted, and driven back by the Serum; for the blood being forced towards the Tumour, whenas it cannot advance forward, yet its bulk being diminished, that it may be able to return back, it discharges the Serum plentifully from it self, and drives it forwards into the places obstructed; which entering under the stagnating blood, dilutes it, and succeeding into its places, forces it back into the passages of the Vessels, and in the mean while that Serum tending forward exhales by the pores; insomuch that the blood which was extravasated being diluted and forced back by the Serum, and the Serum it self evaporated, the swelling with the Inflammation vanishes leisurely away. But if (as in more hot temperaments it comes often to pass) the blood being extravasated and impacted in the pores, be not diluted by the Serum brought to it in great plenty, it will not only stick there pertinaciously, but it will irritate a fiercer Phlogosis with a Fever, and sometimes other dreadful symptoms. So, not long agoe, when a renowned Divine, endowed with a thicker and hot blood, had an Issue cut in the inside of his Leg, although the skin only was cut, an inflammation followed presently, which within a few days so cruelly encreased, that it could hardly be impeded by any Remedies from degenerating into a Gangrene. Wherefore, when the blood being extravasated through the solution of the Union, and wanting the afflux of the Serum whereby it may be diluted and brought back, proceeds into an Inflammation, Fomentations and Cataplasms of Emollients being outwardly administred, do often-times bring help; inasmuch as the moist and soft particles falling from these, go under the blood stagnating, and dilute it, and so pleasingly moving it together, cause it to return the more easily into the Vessels; hence it is, that the moist applications of this kind being administred outwardly, do supply the defect of the intern Serum requisite to dilute the blood; notwithstanding that the blood being so diluted and irritated into motion, might be rendered fit for its Circulation, there is also need that the Vessels which should receive it should be enough emptied, for which purpose Phlebotomy and Purgation are frequently of necessary use, besides a slender Diet. And indeed according to usual custom, we purge Cacochymicks or Plethoricks a little before, or after the Issue is made, and frequently breathe a vein in those Patients. Neither are these Remedies only fit in an Issue new made, to provide against or discharge an Inflammation, but also they are advantageous as often as that distemper ensues upon an old Orifice of the skin. For as often as the blood being very impure, and together growing feaverishly hot, doth enter into a separating turgescence, it frequently happens that it discharges its recrements and feculencies, otherwise unapt to be purged out, about the Fontinel, and there being impeded in its Circuit by them accumulated together, it is extravasated, and for that cause brings on a fierce Phlogosis. Such an affection not long since happening in a renowned ancient person, and being neglected from its commencing, within a short space of time degenerated into a Gangrene; notwithstanding from which by the help of appropriated remedies carefully exhibited, as well inward as outward, he escaped not without great danger of life. At some other time hereafter perhaps, when treating of Cutaneous diseases, we will speak more largely of the Aetiologies and Remedies of an Inflammation, and of an Abscess or Impostumation and Spachela. At the present we will consider the other Symptomes of Fontinels.

The ordinary and best of these is, that the extravasated blood may be reduced.

How it is done.

What Remedies there is need of.

For this end oftentimes purging and bleeding are required.

An Inflammation sometimes happens to old Issues.

2. Whenever an Issue throws out too much Ichor, which for the most part is thin and very stinking, and sometimes discoloured, so that the so vast loss of humour, and that stinking, not to be endured, do require a Remedy; in such a case there will be

2. An Issue pouring out too much and stinking Ichor requires remedy.

Of which there are two Intentions.

two chief Therapeutick Intentions, *viz.* First, that the mixture of blood be strengthened, lest its consistence should be too prone to dissolution and serous efflux: Secondly, That the tone of the place ulcerated by the Fontinel be preserved, and rendred exempt from any putredinal ferment, so that no taint being there lodged in secret, do impart any pollution on the blood passing through in Circulation; whereby it being infected, might presently goe into parts, and the Serum be constrained there to discharge it self more abundantly.

First, that the Temperament of the blood be restored.

This former scope of Curing enjoyns scarce any thing but moderate purging by intermission, and a regular Course of Diet, *viz.* that the Patient be restrained from all surfeit and excess, as to the plenty of Nourishment, the quality, and seasons of receiving it; likewise more especially from small Wines, Cider and other acid liquors, whereby the blood is wont to be dissolved into effluxes. For indeed those that are so affected, do smartly pay for any error or irregularity in Diet, pain being immediately irritated about the Issue.

Secondly, to preserve the tone of the part ulcerated.

For due preservation of the tone of the place where the Issue is made, and exempting it from putrefaction, let sedulous care be endeavoured, that all nastiness be declined, that both the solid things put into the orifice, as also the Coverings, whether Plaisters or Leaves of Ivy, or Oyl cloaths, be changed twice every day; for in some persons any of these will quickly contract a stench, and presently cause the Ulcer of the Issue to putrifie. But if this tends to putrefaction, immediately in place of a Pease or wooden Pill, let a Pill of Virgins Wax be put in, incorporated with red Sanders and Verdigrease: Moreover, let a Fomentation withall, Morning and Evening, with the Decoction of St. John's-Wort, Yarrow, Centaury, &c. be made use of.

Thirdly, a dry and troublesome Issue requires help.

3. Sometimes a Fontinel like a dry Fountain pours out little or no humour; the reason whereof is usually, either for that the orifice being not deep enough, doth not penetrate the whole skin, which is cured by piercing it deeper; or the Ulcer though hollow and large enough, yet remains always dry, because the Serum doth not easily nor in plenty separate from the mass of blood, by reason of its consistence being too much bound up; and then the only remedy is, to wear solid things within the Orifice, which may more provoke or twitch the mouths of the Vessels, for which purpose Pease made of Ivy-wood, or Box, or of the roots of Gentian or Hermodactyls, are often used with success.

An Issue sometimes will heal up notwithstanding all endeavours to the contrary.

4. It often happens, that the Orifice of an Issue being too shallow, and sparingly sweating out Ichor, is grown over with a thin skin with the Pease included therein, and the deep hole is healed up quite; for which fault there is scarce an apt remedy to be administered. Wherefore it is better to close that Issue (rather than always in vain to fret the skin) or transfer it to some other place.

Sometimes it hath spongy flesh growing about the lips.

5. The fore of an Issue tending to healing, and being forbidden, often procures a spongy flesh about the edges, and sometimes in the hollowness it self; the reason whereof is, because the nutritious liquor being conveyed to the ends of the Arteries and nervous fibres, and being not immediately washt away by the serous Ichor, fixes there, and beginning to be assimilated stretches out both these vessels to fill the cavity with flesh, and into these rudiments of flesh both the blood and Animal spirits flow most copiously; and the blood in the mean time being conveyed thither, forms sprigs of veins within that bulk for its return: Notwithstanding this flesh as yet rude and without shape, being excluded for the most part from the hole, grows up over the edge; and when in this manner it rises higher than that it may possibly be covered and cloathed with skin and Cuticula, it remains always naked and spongy. This excrescency is easily enough cured by sprinkling thereon Escharotick powders, of burnt Alum, Colcothar, or Mercury precipitate; for remedies of this kind do eat away the flesh so luxuriating by their acrimony, as well as stiptickness, repel the nutritious humour, and lock up the mouths of the Vessels. As often as that superfluous flesh encreases about the sides of the Issue, it is a sign that the nutritious humour flows thither more plentifully than the excrementitious; and for that cause in Patients so affected that vent proves not always so benign. Wherefore, under pretext of this reason many are averse to that remedy (though surely it is harmless to most, although not alike usefull and advantageous to all.) We have before considered the chief disadvantages thereof, as likewise the scandals objected thereunto; yet there remains another thing according to the opinion or rather error of the Vulgar, a notable objection against Issues, which we will here discuss for a Conclusion.

The reason thereof delivered.

With

With many in *England* a contumacious opinion is grown up (I know not whether it be so in other Countreys) That one or more Fontinels dispose to barrenness. Wherefore this kind of remedy, however otherwise conducive to health, is scrupulously forbidden to all married Women that desire Children; of which Prohibition there is no reason as yet made out, but only Stories related of certain Women that have been barren having Issues; when it were as easie to enumerate more barren women without Issues, and many others that have been fruitfull with them; and truly I use to retort (whenas there is no need of any other refuting) this as a chief Argument against that opinion.

The common error is that Issues dispose to barrenness.

SECT. III. CHAP. V.

Of the Diseases of the Skin, and of their Remedies.

AFTER Attractive Remedies of the *Cuticula* and Skin, namely Issues and blistering Medicines delivered before, by a certain Law of Method we are induced to handle Diseases of those parts, and other kinds of Remedies of divers sorts; the true *Ætiology* of which will afford matter of most pleasant as well as profitable speculation.

As for the fabrick and uses of those parts, it needs not that I should here repeat all things already accurately described, and well known in Books of Anatomy. It may suffice us to note concerning the *Cuticula*, that this outward skin is thin and dense, without blood and without sense, as destitute of Vessels and Fibres, which cleaving to the inward skin, covers and defends it from outward injuries. This is every where full of pores, into whose orifices the Vessels discharging sweat do open, which *Malpighius* viewing more accurately with a Microscope, a little before their gaping or opening, affirms to be endued with little Valves, for the retaining or free breathing forth of sweat: but I confess they lye hid to me.

A Description of the Cuticular

The *Cuticula* being taken away by Fire, or Phænigmons, the skin appears naked, and looks red, by reason of the sanguiferous vessels. But this is a thicker membrane, as to its greatest parts, formed of filaments of Vessels bringing blood, of Nerves, and of nervous Fibres, variously interwoven and complicated among themselves; among which numerous Glandules and Lymphaducts, or Vessels discharging Sweat and Vapours, are thickly interposed. The substance hereof is related to be double by most Anatomists, the outer is nervous, the inner fleshy, or rather glandulous; for an example of which, the Rind of an Orange is brought. If the skin be viewed naked by a Microscope, by the renowned *Malpighius's* observations, First there presents it self a body in form of a Net, in whose thick holes are contained not only passages of Sweat, but also very many Teats in form of a Pyramid, rising out of the skin in parallel ranks, and passing into the *Cuticula*, where being stretcht out in length, they are divided as it were into many little Fibres; which the same Author hath determin'd to be the sense of touching. Besides these, the substance of the skin contains very many Glandules, by which means the Lympha or watery matter is carried by the Lymphaducts or excretory Vessels, out of the Arteries to the Pores. For indeed the most accurate *Stenon* hath observed, that its Glandules lye under every pore; which become either greater or lesser, according to the use of sweating: the sweat or vapours continually streaming out of these by the excretory vessels, avoiding the excrements, do moisten the nervous Teats in their passages, lest perchance they should grow dry.

The pyramidal Papille the Organ of feeling.

The Pores and Glandules of the Skin.

As to the pores or passages of Sweat, they are discovered by a Microscope to be of two kinds, *viz.* The greater, in most of which the roots of the hairs are implanted, and by interspaces, on both sides of each wrinkle of the skin, are disposed in a parallel rank: Or secondly, they are the lesser Pores, which being numberless, do fill up all the spaces between the former in most thick Punctums or pricks. For indeed the whole skin with its wrinkles, appears like a Field furrowed by a Plow, and afterwards harrowed with the ranks turned, or rather oblique; so that its ground being

The Pores two-fold, greater and lesser.

The wrinkles
and furrows of
the Skin.

From whence
the Roughness
or Fineness of
the skin.

Depends much
on the Humours
filling the pores.

From the sudden
shutting up of
the pores.

In the larger
pores are the
roots of the
hairs.

No Diseases of
the Scarf-skin.

The cause of
some.

The Cutaneous
distempers rec-
koned up.

Distempers in
the skin with
or without a
tumour.

being eminent above the furrows of either kind, there remain in its plain, Figures very much of a Rhomboidal or a Diamond-fashion; and accordingly as those furrows, with their banks or flattes, are either shorter and less, or deeper and greater, the texture of the skin appears either delicate and thin, or thick and coarse. This kind of Constitution although it be most owing to ones birth, and to the primogenial growing together of the humours, is however manifoldly altered by reason of the various accidents of the ensuing life. A more gross Diet, difficult labour, injury of Air, and chiefly excess either of heat or cold, render a skin more rough: also contrariwise a nice and delicate education renders its tone more fine and soft.

That the skin may become more neat, smoothe and equal, it avails much that all its pores be filled with a benign, mild and unctuous humour; for so, whilst all its pores become full, and extended, the level of the whole skin appears more smooth: Notwithstanding, if a vicious humour furnish those pores, or the benign humour that was in them be too much exhausted, for that cause the skin will become rough and full of wrinkles. Wherefore if any endowed with a most soft and even skin, shall wet their hands in a Soap Lather, Lie, or Lime-water, or also for some time in warm Blood, presently the furrows and wrinkles will grow greater and deeper, the saline humour being drawn out by the other Salts out of the pores; wherefore more delicate women scrupulously decline washing with Soap or any other things that furrow the skin.

Neither only the humour being too much exhausted out of the pores, but also retained in the same either unduely or above measure, doth render the skin rough and unequal. The hairy pores (which though they are not the only, yet are much the passages of Sweat) do constantly send out more plentiful Effluvia's for the sake of transpiration, wherefore they ever seem greater and more open; but if it shall happen that these are suddenly obstructed by any outward cold, the Vapours being restrained within, they do every where swell up the skin about the places where they break out, and lift it up into little heaps: from hence if at any time our bodies are exposed naked to the Northern wind, or are plunged in a River, the exterior Superficies before smooth and soft, will become rough and rugged, like the skin of a Goose new pull'd. Without doubt those greater pores, being, according to the furrows of the skin, planted parallel and as it were in a rank after the manner of a *Quincunx* or exact Square, are made as so many pits for the planting of hairs as it were trees; for so they appear in four-footed Beasts, and in some hairy parts of men.

These things being thus briefly declared concerning the *Cuticula* and Skin, as touching their frame and uses, there is way enough made to search and unfold the Diseases of the same parts, and the reasons of healing them.

Wherefore first scarce any Diseases properly belong to the *Cuticula*, it being devoid of life and sense. This sometimes being too thick hinders Transpiration, and also sometimes by reason of accidents in some places it grows too thick and callous: but it self being clearly unsensible it is never sick, notwithstanding this is a cause that some distempers which might be blown off by Transpiration, do cleave to the superficies of the skin, inasmuch as the dregs of the blood, and humours, and recrements being thrust forward outwards, having passed through the whole skin, when they cannot evaporate wholly by reason of the thickness of the Scarf-skin, being fastened in the outer skin, produce various discolourations, and stains thereof; of which sort are those spots called Heat-spots, Freckles, or Ephelides, as also scorbutical and malignant spots, also Pimples and whatsoever other stains without any swellings or roughness do seem to besprinkle the skin or outward Scarf-skin, with marks, or some little disfigurings.

But truly as to what belongs to the distempers of the Skin it self in general, since they are various and manifold, they are wont to be distinguished under a various respect, and chiefly that they are either with or without a Tumour; we have but now taken notice of these latter ones.

Distempers of the Skin with a Tumour, are either universal, dispersed throughout the whole body; or are particular, being raised in these or those members, dispersed or as it were by chance.

The former either happen upon a Fever, as chiefly the Small-pox, Measles, or other malignant wheals, whereto also may be added the fleeting pushes of Infants; or happening without a fever, as the Itch, Tetters, and leprous distempers.

The

The outward particular Tumours, or dispersed ones, for the most part do not seize upon the skin only, but also upon the parts subjected, *viz.* now the carneous, another while the tendinous, or membranous or glandulous, and for that cause do exist of a sundry disposition, and of a diverse form. To discourse particularly concerning all these, and to assign the reasons of their Causes, and Cure of every one, would be a matter not only of an entire Tract, but of a great Volume: Wherefore, for the present we will only briefly speak of the Distempers merely or for the most part Cutaneous (of which sort are all spots and Pimples, as also the Scab, or Itch, Tetters, or leprous Maladies): perhaps, an opportunity may happen, when I may treat more specially of Tumours of every kind.

First then (that we may begin with Spots as Affections of lesser moment) those offer themselves called *Ephelides*, because they are chiefly caused from the Sun's heat; for that cause frequent in the Spring, and increase most in Summer, again in Winter they soon vanish. Moreover, whereas they happen in the more beautiful persons, and of a thinner skin, they break out chiefly in those places where the *Cuticula* is most thick, and is exposed to the Sun and Air, *viz.* the face and hands, of a colour yellowish or brown, in magnitude of a Flea-bite, but they exist unequal and irregular as to their Figure. These differ little or nothing from those brownish or yellowish spots which some call *Lentigines* or *Freckles*, which consisting of the bigness of a Lentil, mark the parts of the face as it were with many drops.

1. Spots call'd Ephelides.

The description of the Ephelides.

The matter of these seems to be a more thin portion of the cholerick humour, allured outwards by the force of the Sun attenuating it, and opening the pores of the skin; which beginning to be evaporated, is fixt to the inside of the outmost skin or *Cuticula*, which it cannot pass through. Surely it is a sign these spots proceed from Choler, or other yellow scums of the blood, because they are chiefly familiar to them whose hair is yellow. Moreover, the reason is manifest enough, because they arise more often in a fair Complexion, and in those parts exposed to the Sun and Air; for their more thin skin transmits the humour rarified by the solar heat so far untill it is retained by the thicker Scarf-skin, near the places of issuing out. This affection prefaces or indicates no evil, as to the state of health; and although in appearance it represents something of deformity, notwithstanding that is made good again, inasmuch that it signifies them so spotted, to be endued with a more pure Constitution.

The matter and cause thereof.

Besides these small freckly spots there are others much larger, above a hand's breadth in magnitude, which deform the skin in divers places, especially about the breast and back, one while with brown, another while with pale or blackish spots. These at certain times, as I have observed in many, being wont to arise in certain parts and vanish again, are commonly called *Liver-spots*, and those most mark with them are thought to have a Liver less sound, or at least not well sanguifying; which notwithstanding is not true on this account, but only inasmuch as the cholerick humours, when they are not enough separated from the mass of blood within the Liver, being thrust forward to the skin do so discolour it: which fault also is imputed to the Spleen; for truly this deformity arises, because that the feculencies and excrements of the blood, when not enough received by the Vessels of separation, are together diluted with the Serum, with which they are conveyed to the skin, and in the same place being cast off by the blood, and deserted by the serous Juice while it is evaporating, they are fastened about the outer little holes or pores, even as a mossie down cleaving to the strait places of a River.

Lenticular Spots.

Liver Spots falsely so called.

These spots chiefly appear in Summer, and most upon the Breast and Back, *viz.* at which time and in those places men are most apt to sweat: for that serous Juice which brought out those dregs from the mass of blood, into the strait places of the skin, leaves them there, altogether unable to evaporate. This indisposition hath nothing of evil joyned to it, nor is it a symptom of any present disease, nor doth it preface any suddenly approaching; Moreover, when for the most part it happens to places that are covered, and brings no deformity or trouble, there seems little or no need of Cure: but because an opinion is frequent with the Vulgar; that the Liver is eminently endangered by these spots, and necessarily requires Medicine, for this cause to satisfy the importunate, craving Medicines, we are wont to prescribe, besides extern Cosmeticks, even inward hepatical Remedies; whose use although not very necessary, yet because from thence the depuration of blood, and opening obstructions of the bowels are dispatcht, they are not altogether in vain. The inward Medi-

The Description and cause of them.

cines profitable to this design, are described before among the hepatic Remedies: The Topical or outward are altogether the same in these as in any other kind of spots; some select forms of which we will annex.

*Pestilential and
Scorbutick spots.*

Concerning Pestilential, as also Scorbutical spots, of which we have purposely in another place spoken, there is no need here to repeat the same; especially because for these another method is required, than for those but now described; inasmuch that in one kind of spots, Medicines for the most part outward are wont to be administered, without Splanchnic or Cordial medicines, but in the other kinds only inward medicines, without any that have reference to the Skin.

*The Cure of the
Spots.*

Wherefore, as to the spots called Freckles, Lentigines, and those commonly called Hepatical, they properly belong to the Art of Beautifying; and for the taking away these Deformities of the Skin, only Cosmetick Remedies are prescribed, without any method of healing. There is every where a plentiful harvest of these with curious Ladies, and others, that are solicitous of cleansing their skins; yet all these, forasmuch as they only respect two Intentions of healing, may be reduced to these two heads; viz. either by opening the pores of the skin and Scarf-skin, and sometimes by excoiating this, they do endeavour to have the humour drawn outward, and also to be evaporated; or on the other side, and not with less success, those things are administered that may drive back the spotty matter, and force it inwards. We will annex here in order some usual Forms of the Topicks of either sort, being rationally found out, and frequently made use of happily enough; because it is not lawful without offence of the Great Ones to detect the more secret mysteries of the Cosmetick Art, and to profane it among the Vulgar.

*Forms of Cos-
meticks.*

*1. which cleanse
the skin.*

First therefore for cleansing the skin, and drawing forth the matter of Spots:

Take of a small ly of Salt of Tartar four ounces, Oyl of bitter Almonds made by expression, as much as suffices, in such a proportion let it be mingled, that the liquor turn presently white, and so remain; with this mixture let the parts be anointed morning and evening, and gently chafed.

Take of Aron-roots, Bryony, Solomons-Seal, of each one ounce, Powder of Fennugreek-seeds one dram, of Camphir half a dram, these being beat together, pour on them three ounces of Oyl of Tartar per deliquium, let it be pressed and applyed with a rag twice a day.

Take of quick Brimstone in powder one ounce, black Soap two ounces, tye them in a rag, and hang them in a pinte of Vinegar for nine dayes; after let it be used by washing the part twice a day, and chafing it.

*2. which repell
the spotty mat-
ter.*

Lac Virginis.

Secondly, For the other intention of discussing the spots from the skin, and repelling their matter inwards, *Lac Virginis* was a renowned Remedy among the Ancients, and is as yet commended and made use of by many: The Preparations are well enough known, viz. A Solution of Litharge made in distilled Vinegar, by pouring of Oyl of Tartar per deliquium, it is precipitated into a white liquor like milk, with which let the face and hands be washed twice a day, and gently chaf'd. A remedy like this or of the same vertue is prepared out of the solution of red Lead or Cernise made in the same Menstruum, and precipitated with Alum Water, or a Solution of Sal Gem. Or,

Take of Camphir sliced two drams bruised in a glass Mortar, pour thereon leisurely the juice of one Lemon, then adde one pint of White-wine, strain it, and let the remaining Camphir tyed in a rag be hung in the Glasi.

Take Verdigrise four Ounces, pour thereon two pints of White-wine Vinegar, being put into a Cucurbite-glasi, let them be distilled in Sand, let the Phlegme be kept for use, with which let the face be anointed twice a day.

For this purpose also the Phlegme of Vitriol doth notably conduce. It suffices some to use the distilled simple water of Bean-flowers, or of Fumitory, or the liquor of a Vine distilling from the Boughs cut in the Spring-time. Notwithstanding the more nice, and those who chiefly boast to understand this Art, are scarce content with any Remedies but Mercurial, wherefore the following water is commended and sold by Empiricks at a great rate against all foulness of the face whatsoever.

Take

Take of Mercury sublimed one ounce powdered, put it in a Tin Vessel with three pints of Spring-water, let them stand twenty four hours space, ever and anon stirring it with a wooden Spatula untill the whole liquor grows black, which notwithstanding being philter'd through brown Paper, becomes clear; with a rag or a feather dip in this, let the face be gently done over once or twice in a day.

This Remedy doth most notably help against all cutaneous Deformities, viz. inasmuch as it drives away the humours within the little pores, and those impacted within the little holes howsoever small, dissolves the inveterate and stubborn combination of Salts or Sulphurs, and restores the whole skin, (where it is applyed) though evilly framed as to its pores, and makes it well coloured. Wherefore it is useful not only to cleanse the spots of the face, but also to take away wheals and its redness, as also the Disease of the Erysipelas. Moreover, sometimes it happens that many parts of the face, especially the Nose and Forehead, are markt with most thick Specks looking black, as if burnt by Gunpowder, which proceeds from hence, because the sudatory pores are sometimes fill'd with a more thick black humour, another while with little worms with black heads (which little Insects being squeezed out of the pores, and exposed to the Sun, are easily seen to live, and to move themselves) and in such a malady of the skin, no Lotion or Oyntments are wont to profit, but what are Mercurial; notwithstanding to this Hony there is a Thorn at hand more than enough malignant. For the particles of the Mercury together with its Salts (by which they are divided and sharpened into small bits) being applyed to the face, do shake off the peccant and uncleanly matter out of the Pores, and expell it thence, but having driven it back, they pursue it in, and readily insinuate with the Blood and nervous Liquor, whose temperaments they prejudice. Yea by meeting with these they imprint very often on the Brain and sometimes on the Præcordia and other parts, their virulency that can never be wiped out. From hence it is frequently observed, that women or men that have long used Mercurial Cosmeticks, are troubled with a Vertigo, and convulsive Distempers, or are obnoxious to paralytical, and their Teeth grow black, and sometimes fall out.

its Vertue.

its familiar use is not safe

SECT. III. CHAP. VI.

Of the Mange or Scab with the Itch.

After the more simple maladies of the skin, viz. those which happen without any Tumour and Ulceration, and only deform it with spotted appearances, we will now in order treat of the more grievous Affections, and those which dissolve the Unity, and especially of the Pfora or Scab, which in sundry and frequent places of the whole Body doth much infest the skin with a painful Itch, and with small Pustles and breakings out, being sometimes dry and often scaly, and another while moist and disposed to ulceration; and a malady of this sort is most properly the Disease of that part, considering it frequently begins in the very skin by reason of some outward Contagion, and often receives Cure by certain Remedies applyed to the skin only, at least the reason of both holds so far, that it is seldom otherwise undertook or perfectly cured.

Pfora a disease properly cutaneous.

The Pfora or Scab is vulgarly described to be a breaking out of Pustules and wheals throughout the whole body, here and there, procured from a sharp and salt humour heaped up in the Pores of the skin, and that it may be discolled from thence, induces a notable Itch, and a necessity of scratching.

its description.

That we may search duly into the causes of this Disease, and the reason of the symptoms, we will more deeply enquire concerning the matter effecting and the conjunct cause thereof, that it may certainly be known of what sort that humour is which is heaped up within the skin, by what means it is either generated there, or comes from some other parts, afterwards in what pores or little places it is contained, and how endeavouring to break out, it doth create so troublesome an Itch.

Where:

What humour
its matter is of.

Not any of the
four common
humours.

But a humour
plac'd in the
Glandules of
the skin.

The description
of that Juice or
Humour.

How it dege-
nerates.

This is done
three ways.

1. By reason of
impure Blood.

2. By mere
stagnation.

3. By Conta-
gion received
from without.

Wherefore about the origine of this Disease, that we may not impute the fault with the Ancients to the Liver or Spleen, the matter thereof is not any particular humour of the four commonly supposed ones, not Phlegme, nor yellow Choler, nor black, neither also the blood apt of it self to be extravasated; moreover neither doth it seem to consist of two or more of these humours mixt together. For though such humours be granted, notwithstanding if this Disease always consist of them, it would not so easily be catch'd by a meer and light contagion, or receive Cure by an Oyntment alone. Wherefore it is rather to be supposed, that the morbid matter is the humour of the Lympha constantly resting in the glandules of the skin; notwithstanding degenerating from its genuine disposition, that is to say, its volatile-salt, into an acid or otherwise offending disposition. For when the continual Supplements from the blood come to this so depraved, and uncessantly evaporating, these Juices new and old do not easily agree, or are united, but boiling together after the mutual custom of dissimilar Salts, they are coagulated into a recrementitious matter, which filling and distending the pores of the skin, every where raises it into Tumours; Moreover it something hinders the Blood in its passage, and constrains it to be extravasated. From hence thick Pustules are raised, and because that matter passing into an Ichor is compelled by the Serum and Blood pursuing it still forward, they rise up into little heaps; afterwards the Animal Spirits entring inordinately into the nervous Fibres, that they may promote the throwing off that ichor, do cause the sense of that troublesome itch.

Indeed an inspection with a Microscope doth most clearly discover that there is a lymphous humour in the glandules of the skin which lye under all the sweating pores, treasured up for some uses, so that according to the plenty and diverse stay thereof, these Glandules exist more or less turgid. This Juice is laid aside by the Blood, through the Arteries, in these Glandules, that this little burthen being cast off, it might return more easily through the veins; in the mean time being reposed there, it hath its uses, viz. In the first place continually moistening the miliarie Teats, which lying under the nervous little Fibres, are the proper Sensory of Touching, it preserves them from dryness, which would hinder the Sense; also it imbues the adult effluvia's passing uncessantly from the blood being kindled, in their passage near the skin, with a certain moisture, and renders them fit to be voided by the pores; and whilst part of this humour doth so continually evaporate with the Effluvia of the blood, those expenses are repaired by the Lympha continually fresh, being deposited by the Arterial blood as is above said.

Notwithstanding this oeconomy of the Region of the skin is not always so regularly kept, but that the glandulous humour falling from its own disposition and function, not only will provoke in the skin, but sometimes in the whole body, preternatural affections of divers sorts. This growing clammy, and cleaving more obstinately in the little Cells obstructs transpiration; and immoderate sweating proceeds from its too plentifully flowing out, and from the same restagnating inwards, a more than usual Diuresis. Moreover, as to what belongs to the Scab and pustulous eruptions, that humour as it is wont to be depraved many ways, so chiefly these three, and is wont to enter into a coagulative disposition with the Serum, being fresh poured out from the blood, viz. First the Blood it self being very impure, and also dissolved, it leaves its corruptions and superfluous dross in the cutaneous Glandules, which in the same place putting on the nature of more corrupted ferment, they boyl up with other adventitious Juices, or passing by these, and are diversly thickened, and so they beget not only pustulous affections, but also leprous of divers kinds. From hence the daily and often eating of Shell-fish, and also of others; and of salted meats that have been hung in the Sun or Smoak; also the taking disagreeing Drinks, and venomous Medicines, do cause cutaneous and frequently dreadful eruptions.

Secondly, The humour being heaped within the cutaneous Glandules, sometimes doth not only become pustulous by a mere stagnation, but also frequently Loufie. Wherefore, not only they that have been long in prison, but also those who being of a sedentary life, are used to nastiness and sluttishness, do live obnoxious to the above-mentioned maladies; inasmuch as the cutaneous humour being not at all eventilated, is corrupted by mere standing, after the manner of putrefying water, and so it puts on the disposition of a corrupting ferment; to which moreover Supplements of putrefaction come from the blood in the like manner depraved.

Thirdly, If perhaps these Causes are wanting, that the glandulous humour of the skin,

skin, neither contracts any stain from fault of the blood, nor its own proper stagnation, notwithstanding virulent steams communicated from without, render it no less prolific as to those diseases. This is manifest by common observation especially, forasmuch as they that have health most, and are endowed with the best Constitutions, scarce ever escape free from the same, if they lye in the same Bed either with a scabby person, or where he hath lately lain: and not only so, but moreover the Linnen of the Scabby, oftentimes washed with other Linnen have bestowed the contagion upon others. Surely, the taint of no disease (the Plague only excepted) is more easily or certainly propagated than this of the Mange.

If the reason of this be enquired into, we presently say that the liquor susceptible of the scabby taint is mightily exposed, and most easily disposed unto it; and indeed much more ready to either, than the Blood or Nervous Juice. For the glandulous humour of the skin abounding in the outer superficies of the body, first imbibes every atome let in by holes and pores every where open, and anticipates them from the blood. Moreover, that this is so soon infected with a scabby Contagion, both the activity of the ferment communicated causes it, and also the proneness of the glandulous liquor to degenerate. For indeed the effluvia's falling from the breaking out of the scabby skin, are aptly enough compared to the Yest of Ale, remaining on the top as it were its outmost Coat; of which if the least portion be taken from thence, and mixed with other new Ale unfermented, presently it ferments the whole mass how great soever, and changes it into the disposition of the liquor from whence it was taken. Certainly there is a very considerable energy, which the particles however so small and little, carryed to the highest activity, are able to perform; but especially if they fall into a liquor (of which sort is the cutaneous) made up together of subtile particles of several sorts, as well partaking of the blood, as of the nervous Juice, and for that cause most readily apt to be fermented. Wheresoever therefore these effluvia's of the Contagion abovesaid hit against any outward part of a healthful body, first they will infect the cutaneous humour only planted in that place, but then the particles of this so corrupted, being received by the venous blood, and presently delivered to the Arteries, are diffused through the entire habit of the body, and in a short time defile the whole mass of this Humour, and make it scabby.

From these Causes of a Pfora as well adjunct as procuring being unfolded, the reason of the first symptoms, or breaking out in Pustules, is manifest enough; but as to the other, viz. the Itch, as it is troublesome to Sense, that the formal reason thereof may be known, we ought to consider to what Sensory or organ of sense it properly belongs, and of what sort its passion or affection should be.

Concerning these things, first it is sure it belongs to the sense of touching, and that the first Instruments hereof are Teats fashioned like a Millet, and their little Fibres dispersed through the whole skin, as we have before declared. Moreover with this sense all the nervous fibres are endowed, being diffused throughout the whole body. Notwithstanding, whereas there are two supream passions of Touching, and as it were generical, viz. Pain and Pleasure, it is deservedly doubted to which of these Itching ought to be related. For the solution of which, we ought to shew by what means the Animal Spirits, being inmates to the organ of Touch, are affected in Pain, and also after what manner in Pleasure; then their demeanour also as to the Itching being design'd, it will easily be manifest of what Province this Passion is, and in what things the nature of it, and the manner of its acting do consist. Let the Reader pardon me, if I should by way of digression expound this more at large, and even to tediousness, because this Aetiology seems very necessary both to the understanding and curing of most outward distempers. Pain being distinct from Sadness, and belonging to the Touch, is used to be defined, *A troublesome feeling proceeding from the dissolution of Unity*. And indeed it takes its origine as often, and in as much as any sensible thing, disagreeable or impropportionate, being applyed to that organ of sense, divides and separates the fibres one from the other; and for that cause repelling the animal spirits inhabiting in them, from their wonted and quiet emanation, distracts them from one another, and as it were puts them to flight; then presently forasmuch as that outward repulse of the spirits, is communicated by a continued order of other spirits, to the first organ of Sense, it stirres up the Spirits dwelling there into the like confusions, so a perception is caused of grief or pain inflicted outwardly. In truth the whole series of animal spirits which are affected with pain, as it were some singular member of the sensitive Soul, conceiving trouble, as it were,

The reason of its most sudden contagion is unfolded.

The Contagion when any where received, presently spreads over the whole skin.

Of the Itch.

It belongs to the Sense of Feeling.

Of what sort its Affection is.

The chief Affections of feeling are Pain and Pleasure.

The formal reason of Pain.

from

from the impression of the object, is forced to be wrinkled with pain, and to contract it ſelf into a leſſer dimension.

The Solution of the Unity always the cauſe of it.

When a diſſolution of Unity is ſaid to be the cauſe of pain, we muſt not underſtand it ſo as if this affection only were cauſed from a wound or blow inflicted upon the body, for the ſame thing is uſed to be induced from cold, heat, wind, from the extravafating of the blood and of other humours, or their being heaped up together in ſeveral places, oftentimes the fashioning of the member remaining as yet entire; in which caſes, although the continued parts, and chiefly the fibres and filaments, are not at all cut off, notwithstanding they are in every Affection of grief pulled from their uſual poſition, either by the oppreſſion of the object, or by ſtrange particles forced like wedges, and are compelled into too much tenſion or diſtortion, or divulſion; and for that cauſe the inmate ſpirits being pulled from their mutual embraces, and diſſipated, are ill at eaſe, and incur the paſſion of pain or grief.

What Pleaſure is.

Pleaſure is oppoſed to Pain, and is a manner of Feeling clearly contrary thereunto; which takes its origine, inasmuch as a pleaſant ſtroaking being made upon the organ of Senſe, the ſpirits flock thither, and preſently being thickly gathered together, and overſpread with a certain delight, they do as it were exult and rejoyce together in the organ: afterwards, inasmuch as the ſpirits enter into the like triumph or rejoycing within the *Corpus ſtriatum*, a perception of pleaſure is ſtirred up.

Its formal Reaſon.

The greateſt pleaſure which is offered to the Touch, conſiſts in this, that the cauſe of Pain being removed, the parts formerly affected by it, may recover their wonted temper and frame; for ſo the animal ſpirits being before put to flight, and diſperſed from one another, they recollect themſelves, and ruſhing into the places from which they were baniſhed with reinforced ſtrength, they prepare themſelves to rejoyce. From hence the Peripateticks placed the formal reaſon of Pleaſure only in the removal of ſomething that was troubleſome, as when the exceſſe of cold or heat is received by an oppoſite and more agreeable ſtate. Indeed the tangible object (becauſe it is alwayes thick and dull) doth ſcarce any way elſe (excepting Venery) allure the animal ſpirits into heaps to the organ of Senſe, unleſs for that it removes their former conſuſion.

What the Itch is.

From theſe things ſo deſcribed concerning thoſe paſſions, it is eaſily manifeſt, that the Itch according to the formal account thereof, is neither perfectly nor fully either Pain or Pleaſure, but imperfectly and as beginning, partakes of both. For really the ſcabby matter being heaped up within the pores of the ſkin, and making the ſolution of Unity in many places, enclines towards pain: yet as it is volatile, moving, and haſtens towards vent, for that cauſe the Animal ſpirits are not put to flight from the Fibres although pulled aſunder, neither are they driven back with ſenſe of pain; but the contrary, as if being ſtronger than the humour infeſting, they were able to caſt it forth, they being wrapp'd up more thick, but irregularly within the cutaneous fibres, do twitch them together variously, and draw them on, that they may the ſooner diſcharge the morbiſic matter, and expell it forth. Wherefore inasmuch as the Animal ſpirits being neither put to flight, nor repulſed, but flowing together in crouds into the organs of Touching, they manage themſelves there tumultuouſly, and diſorderly, and as it were by tickling the ſenſible fibres do provoke them into ſmall Convulſions, no pleaſure, but a troubleſom feeling, nor alſo is it Pain, but a Paſſion clearly diverſe ariſes from it. But as ſoon as by rubbing or ſcratching, the plenty of ſpirits aſſembled about the organ of Senſe, begin to be better diſpoſed, and as it were reduced into order, from thence a thorough feeling of Pleaſure is introduced. Wherefore the Itching ſeems to be a middle-ſtate between the beginning of Pain and Pleaſure, or a paſſage of the ſpirits from the rudiments of that, towards the full compleating of this. But from this Phyſical diſcourſe by the by, let us return to our Pathologie or diſcourſe of the diſtemper. From what is above ſaid it is eaſie to collect the differences of this diſeaſe.

A certain medium between Pain and Pleaſure.

The difference of the Pſora as to its origine.

In the firſt place therefore the Pſora as to its origine either is got by Contagion, or by reaſon of an ill Courſe of Diet, the fierceneſs and ſupply thereof is communicated by the Chyle and Blood being vitiated, or it is generated in the ſkin it ſelf, by reaſon of filth, and the defect of Tranſpiration: Where to we may adde, that ſometimes Infants acquire this taint hereditarily contracted from their Parents.

Secondly,

Secondly, These cutaneous Eruptions as to their form, vary according to the diverse Constitutions of the persons affected: for in some persons of a cholerick dryer Temperament, or Melancholy, only a dry Scab is stirred up, and inasmuch as it evaporates less by reason of the defect of the Serum, with an Itching not altogether so troublesome; but in others of a moister Temperament, and of more unclean blood, very many wheals and pustules imbued with Ichor, and most of all itching, do very much provoke to scratching, and by reason of the Ulcers stirred up therewith, the Itch is immediately altered into pain.

As to the Prognosticks, although this Disease is never of it self mortal or very dangerous, and always easie of Cure: yet frequently it contains an evil event; inasmuch as being long continued, it utterly depraves the blood and nervous Juice, and from it hastily cured, by reason of the matter received within, while it is discuss'd from the Pores, a pernicious taint is brought upon the Præcordia, and Brain, and other noble parts.

The greatest hazard from a Scab, threatens Children and Cachectick persons; as in both of which the taint is more easily impressed from this Cutaneous humour upon the nobler parts, which afterwards when the outward malady is removed, remaining within cannot be vanquished entirely, but by a very long Course of Physick, of which neither is capable nor patient; wherefore, such persons, all care and diligence being administred, ought to be preserved from the infection of the Scab as from the Plague.

Concerning the Cure of a Scab or Pfora, two chief Indications present themselves, and each of them two-fold, viz. The first intention Curatory respects these two things, First, that the glandulous Humour (its corruptive ferment being wholly extinct) may be reduced to a due temper. Secondly, afterwards that the pores and passages of the skin being freed from those Ichorous congealings, may recover their pristine frame or good temper.

The Second Indication Preservatory takes care to prevent these two things, viz. First, lest the impurity of the Pfora, or corrupting Miasma's of the skin, being discuss'd from the skin (while the ferment is expugned) turn back again into the blood and nervous liquor, and bring upon them not only ill temperaments, but also (as frequently it uses to doe) a more considerable prejudice upon the Brain or Præcordia. Secondly, also let it be endeavoured that the taint of the Humours, and of the noble parts contracted from the Itchy matter, may be eradicated while the faults of the skin are repaired.

All these intentions of Curing, by remedies internal as well as external together, being much and often used, ought to be joyn'd together, or at least-wise to be inter-us'd, viz. that the morbid matter being discuss'd from its recesses, may not depart into and lye hid in any lurking-places any where else, but from every part, inwardly and outwardly, by remedies taken, may be wholly removed away; wherefore Purgatories ought alwayes to begin and end this method of Curing. Although Helmont with great pomp overthrows this Cathartick method of Physick, and as it were leads it in Triumph, because it doth not cure the Scab by it self, yet we may affirm this Disease without that remedy can scarce ever easily be cured, but never safely. Moreover Phlebotomy, unless something contradict it, is presently to be celebrated in the beginning; upon these, Alteratives that cleanse the blood and strengthen the bowels, and defend against the assaults of the morbid matter, challenge their turns; and in the mean time Liniments, or Baths, or topical remedies of another kind, and properly Cutaneous, are administred: As without which not only Purging and Bleeding, but also Diaphoreticks, Diureticks, yea whatsoever remedies evacuating blood or humours, or altering them, become useles. We will annex some more select short forms of Medicaments, of every one of these Kinds but now recited. And first for the due undertaking of the Purging part, let there be administred in the beginning a purging Medicine or a Vomit; also after Phlebotomy being used (if need require) an Apozeme or purging Ale may be administred for seven or eight dayes.

Take of Electuary Diacarthamus three drams, Spec. Diaturbith with Rhubarb one dram, Cream of Tartar, Salt of Wormwood an. half a scruple, Syrup of purging Apples qrs. what suffices, make a Bolus to be taken with Government. Or,

Take Sulphur of Antimony seven grains, Scammony sulphurated eight grains, Cream of Tartar half a scruple, make a powder.

Z

Take

Take roots of Polypody of the Oak, sharp-pointed Docks prepared, an. one ounce, leaves of Senna ten drams, Turbith, Agarick, Epithymum, an. one ounce, Carthamus-seeds half an ounce, Citrine Sanders two drams, Annise, Carue-seeds, of each two drams, being sliced, bruised, &c. digest them warm in four pound of White-wine twenty four hours, pour it clear off without straining: the Dose six ounces by it self, or with a spoonful of syrup of Epithymum.

Apozems.

Or take the foresaid Ingredients and boyl them in six pound of Spring-water to half, then adde one pound of White-wine, and presently strain it for an Apozeme to be taken as the former.

Medicated Ale.

Take roots of Polypody of the Oak, sharp-pointed Docks an. three ounces, Senna four ounces, Epithymum, Turbith, Mechoacan, of each two ounces, of yellow Sanders one ounce, Coriander-seeds six drams, prepare them according to art, make a bag for four gallons of Ale; draw it after five or six dayes, take twelve ounces more or less every morning, for eight or ten dayes.

For ordinary Drink let a little four-gallon Vessel be filled with small Ale, wherein may be put the following Bag.

Take the tops of Tamaris, dried Fumitory an. four handfuls, roots of sharp-pointed Docks dried six ounces, the rinde of woody Night-shade two ounces, slice and bruise them and mingle them. Or let them take a Bochet of the Decoction of Sarsaperilla, Saunders, with shavings of Ivory, Harts-horn, and Liquorish.

Altering Remedies.

II. As to what belongs to altering Remedies, beside the Physick-Ale for ordinary Drink, there seems not need of many others, but only, that a due government of Diet be observed, by declining Salt and spiced Food, Shell-fish, and others seasoned with pickle; also abstinence from Wine, Strong-waters, stronger Ale, and from all Liquors apt too much to stir and ferment the blood. In a contumacious *Plora*, and seizing upon a Cachectick body, it will be expedient to administer the following Electuary with a distilled water twice a day.

Electuary.

Take of Conserve of Fumitory, roots of sharp-pointed Docks, of each three ounces, Troches of Rhubarb, Species of Diatrion Santalon, of each one dram and a half, Salt of Wormwood one dram, *Parvolum Martis* four scruples, with a sufficient quantity of Syrup of Cichory with Rhubarb, make an Electuary, the dose from one dram to two, twice in a day, drinking upon it three ounces of the following water.

A distilled water.

Take of the tops of Fir-tree, six handfuls, of leaves of Fumitory, Agrimony, Fluellin, Liverwort, Brooklime, of each four handfuls, roots of sharp-pointed Docks two pound, Bark of Elder two handfuls, the outward Rinds of six Oranges, cut them and bruise them, and then pour upon them eight pints of Posset-drink turn'd with middle-beer, distill them in a Rose-Still; let the whole Liquor be mingled together.

Oyntments whereof the Basis is chiefly Sulphur.

III. Oyntments for to anoynt the Skin, are wont commonly and efficaciously to be prescribed for the curing of the Scab; notwithstanding those which are administered to many other Tumours or Ulcers, do not help here at all; but Brimstone and Preparations thereof seem to have a specific vertue in this Disease, so that for the most part they are put into all Liniments for the Itch, and are the basis of the whole Composition. The Receipt chiefly used by the Vulgar is this.

Forms of them.

Take Powder or flower of Brimstone half an ounce, unsalted Butter four ounces, powder of Ginger half a dram, make an Oyntment.

A little more neat, though not much more efficacious is prescribed thus.

Take Oyntment of Roses four ounces, powder of Quick Brimstone half an ounce, Oyl of Tartar per deliquium what suffices, make an Oyntment: for scent sake adde one scruple of Oyl of Rhodium.

Other stronger Medicines.

When the force of the Brimstone is to be drawn forth or strengthened by other things added,

Take Oyntment of Enula-campane without Mercury four ounces, powder of Sulphur half an ounce, Oyl of Tartar per deliquium what suffices. For the same purpose the Oyntment

ment of the roots of sharp pointed Docks boyled in Butter, or Oyl, with White-wine, to the consumption of the Wine, and made up with Sulphur and Oyl of Tartar. Also those Oyntments are used with success by themselves, the more curious abhorring the smell of Sulphur.

3. The third kind of Liniment against the Itch, is made of Mercury, wanting no guards of Sulphur, or any other Vegetables. But of it self it is too powerfull to be applyed all over the body, but only to the Joynts of the Arms and Thighs, or worn about the Loyns, made up in a Girdle, for so it seldom fails in curing the Itch. Notwithstanding there is danger lest this practice (as it often happens) produce evil and pernicious symptoms; for from the Mercurial Oyntment, frequently a salivation, also sometimes dimness of the eyes, or drowsie or convulsive Affections do proceed: Also sometimes the Poyson of the medicine within the Præcordia or Bowels produces the dreadful Affections of short breathing, Swouning, or bloody Fluxes.

The most powerfull made of Mercury.

But dangerous.

The vulgar form of a Mercurial Oyntment, and chiefly in use for the Itch, is this.

The Form of it.

Take of Quick-silver reduced into small particles with an acid, or (as they say) kill'd, an ounce and a half, fresh Hogs Lard six ounces, incorporate them well, stirring them long in a Stone or Glass mortar.

Neither only under the form of an Oyntment, but also after many other wayes the afore said Medicines are wont to be often used. For the fume of Cinabar (which is prepared of Mercury with Sulphur) cast upon Coals and taken in at the mouth, or striking the superficies of the Body, cures the Psora. The Mercurial Cosmetick before described, being weaker by two degrees, if it be applyed upon the Skin, chiefly on the ulcerated places, it kills the Scab. Notwithstanding the use of these is not always so secure as to be administred every where to all persons.

A Mercurial water for the Itch.

Baths are prepared of Sulphur and Vegetables, either apart or together, being boyled in water, which heal this Disease not as a common Bath, by only washing off the filthiness of the Skin, but also by destroying the ferment thereof. Moreover, beside these there is another more easie and neater manner of healing the Itch, viz. Let a Shirt boyled with Powder of Brimstone in Spring-water, and dried by the Sun or Fire, be worn next the body for four or five dayes; for so that disease is wont to be cured without bathing, or nastiness of anyointing, or evil smell.

Baths.

A Sulphurous Shirt.

If the Ætiologie of these be enquired into, and first why Brimstone is such a specifick Antidote against the Itch, that poor and ordinary men (who have not wherewithall to use any other Medicine) do take against this Distemper inwardly only powder of Brimstone with Milk, and administer it outwardly with Butter, I have already in part given an account, where we have unfolded the balsamick vertue of Brimstone towards the Lungs. Namely, it is a good expedient in either case, inasmuch as it destroyes the acidities of the Blood and Humours, and all the exotick and corrupting roughnesses, and restores a benign disposition to every Juice, viz. a mild and an unctuous: and so the Particles of Brimstone any way outwardly applyed, do easily enter into the pores of the skin, and being admitted inward, do forthwith work upon the ulcerous Ichor there abounding, kill the Salts there predominating, and procure a balsamick nature to the cutaneous Juice, that it may afterwards agree with the Blood and Serum continually flowing to it.

Why Sulphur is the Antidote of the Psora.

The Reason of it.

As to Mercury, it is no wonder if Medicines prepared hereof do thoroughly heal the places of the skin affected with the Psora wherever applyed, for by the application hereof, wheals and pushes, and all malignant ulcers, viz. Venereal and Scorbutick, are wont to be tamed. Neither is it a thing to be admired, that these Remedies administred in any private places, as long as they provoke salivation, are a Cure of an Universal Itch; but really that without spitting they can produce such an effect, as that a Girdle wherein Quick-silver is sowed and worn about the Loyns, should abolish the Scab of the whole body, and that sometimes without any sensible evacuation or harm caused thereby, I say the reason hereof is not so easily apparent.

How Mercury cures this Disease.

Yet for the solution hereof, we must say that the Particles of Mercury being able to extinguish the scabbiness of every Itchy ferment, when they are applyed to any private part, do presently take away the Scab of that place; and besides being caught by the venous blood, and diffused through the whole masse thereof, and a little after they are not only carryed back by the arterious blood to the same place

The reason of its vertue.

place where taken in, but being brought outward every where, they are deposited in the skin of the whole body, and in the same place destroy every Miasma of the Scab: If it then shall happen that these Mercurial particles, after they have finished the Cure, should be all evaporated again out of the skin, no salivation afterwards, or other prejudice will follow.

SECT. III. CHAP. VII.

Of the Impetigo or Lepra of the Greeks.

*Several names
of the Impetigo.*

After the Scab with the Itch, it follows that we treat of another Distemper, a little a-kin to this by reason of the breakings out of little pustules, which is commonly call'd *Impetigo*, by some a Tetter and Morpew, and by others the Leprosie of the *Greeks*. And as it gains several names, so they are variously applied by Authors, and by these they design one kind of Disease, and by those another kind. Wherefore, as the names of this Distemper are variously confounded, and perhaps that as to its nature and formal appearance it has been various in divers Regions, neither may it be altogether the same in our generation as in former times, for this cause my business here shall not be to describe this disease according to Books, but from the proper observation of the Patients themselves.

*It is described
according to its
appearances.*

The Impetigo is wont to arise and affect after this manner; to wit, little wheals or red pustules, sometimes single, and sometimes many together, are raised in divers parts of the body, but chiefly in the Arms or Thighs; to each of which, new ones every where are adjoyned, (the Disease augmenting) and in a short space of time there become many heaps of risings of that kind, like clusters. For the little pimples breaking out daily near to their stemme, and spreading still larger, diffuse themselves into a Circle, and so cause every heap of Eruptions to be enlarged. The rough superficies of each appears something white and scaly, so that upon scratching the scales fall off, and often a thin Ichor sweats out, which being presently dried up again, hardens into a shelly scale.

These Clusters of little Pimples being first small and fewer, appear perhaps three or four in the Arm or Thigh, or other particular member, about the bigness of a Penny or half a dram: but afterwards, if the disease be suffered to augment, they break out every where more frequent, which being leisurely encreased in their ground, afterwards appear to equal or exceed the bigness of a Silver Crown, but not always round or of a regular Figure, but diversly formed. Moreover there is no stop in this condition, but the distemper, unless it be restrained with Medicine, breaking out still in more places, and creeping on every where in broadness, at length not only covers over the whole member but also the whole body with a leprous dry scurf; and this kind of Impetigo the Ancients call'd by reason of its outrage *Αγρευ*, and for the most part accounted it incurable.

*The differences
of this disease.*

From hence the chief differences of this disease are made known; and in the first place as it is less or more malignant according to the fashion thereof, it is distinguished, as it comes nearer the nature of the Scab, or Leprosie, or as it is in a middle condition between both. We are also to note, this distemper sometimes infests some particular members, as the Arms or Thighs, the rest of the body being untoucht; but sometimes it begins together in all parts, and every where excites scatteringly little Pimples or Clusters thereof. Also eruptions of this kind are in some for a season, or periodical, and for the most part infest these persons during Winter only, vanishing away about Summer; likewise on the contrary, in others they abhorre Winter, and are wont to observe the season of the Swallow going and coming: but in most others the Disease being continual grants no truce, yea it hath neither remission nor mediocrity.

*How it differs
from the Pfora
and Leprosie.*

Moreover, we must distinguish an Impetigo from other Diseases a-kin to it, and first from the Scab, and the Leprosie. It differs from the former as to the form of the Pustules; for every where in the Pfora they are single and remote from one another, although by small spaces; here most of them break out in Clusters, con-

currently,

currently, and as it were disjoyned by branches with great interspaces. But between these distempers a notable difference yet arises, in that the Scab is wont easily or scarce otherwise to be propagated or arise, but by Contagion; but the infection of an Impetigo is so seldom or never, that the Miasma from the Husband doth not pass to the wife, or from her to him, though they lye together.

Also this Disease differs from the Leprosie, as well in respect of the form of its eruption, as of its contagion, which is likewise active in this, as in the Pfora; and the breaking out is much larger and more horrid, viz. it is every where shelly and scaly, without intermission, and diffused through the whole body.

From hence it is manifest, that the material cause of an Impetigo, is not merely a cutaneous humour, by reason of effluvia's or a taint received from without, or depraved by reason of other accidents, and degenerated from its temperament; because it is not easily communicated to others by Contagion, as in the Pfora, neither is it immediately dispersed throughout the whole body. But indeed little Pustules breaking out first about the initiations of the Disease seem therefore to proceed, for that certain acid salt Concretions happen to be in the mass of Blood (like Tartar in Wine) which when they can neither be concocted or again dissolved, are here thrust out into the skin, as there into the sides of the Vessel. As long as these Concretions are small and few, they are conveyed into the skin in this or that member, and by one or two branches of an Artery; then as Nature is wont to continue the same manner of excretion as it began, the matter being carryed every where by the same vessels, to the same nests, near the first wheals it causes heaps of others round about them; but afterwards when the dyscrasie of the blood is daily augmented, and that Tartarous matter is generated more plentifully in the mass thereof, more portions are conveyed by other Arteries, and still by more to the outward places: and for that cause also more pimples break out both in the same, and in other members, which a new matter coming continually by the same Arteries, and being placed close to the former, enlarges them every day, and every where dilates them by the addition of other pustules; and at length if this sort of Tartar of the blood augment hugely, being carryed out by more or all the Arteries together, it is fastened in the skin, and in process of time covers over all the superficies thereof with a scaly or downright leprous shell: And then that cutaneous humour being wholly corrupted, promotes the disease it self; for it causes the stock of the morbid matter to be encreased, by polluting more, or rather poisoning the blood and humours, whilst they pass in Circulation; moreover dismissing the corruptive steams from it self, it renders the Contagion of the same disease unto others.

The material cause not a humour of the skin.

But tartarous Concretions be-got in the blood.

Wherefore, both the procuring and conjunct causes of this Disease consist in this, for that without any fault of the skin, it happens that the blood is filled with salt Particles of a various disposition and condition; (into the preceding cause of which disposition we will anon inquire) and where those fixt and acid Salts are especially predominant (as the manner is) they mutually embrace one another, and so grow together into Tartarous Concretions; which being thrust forth into the blood, cause eruptions of wheals, as it were nests of the Disease; then they being daily and leisurely encreased both in number and largeness, according to the supply of matter, they produce the beginning, augmentation, and state of this disease.

The next cause of it.

As to what relates to the antecedent and evident causes, there are two chief kinds of occasions from which this distemper for the most part derives its origine; to wit, an evil manner of Diet, or a taint of the Scurvy, or Pox, or other Diseases left in the body, being ill, or not at all cured. We will weigh a little the reasons of each of these.

The evident Causes.

As to the former, besides the common irregularities in Diet, wherein some being too much addicted to eating of flesh salted and afterwards dryed in the Sun or Smoak, and the drinking of acid Wines, do easily contract this malady; Also it is a vulgar observation, that very many are disposed thereunto by the too frequent or daily feeding on Pork, and Fish, and especially Shell-fish. There is a notable instance of the former, which is, that that food was chiefly forbidden the Jews for prevention of this disease. Also there is an example of the other, that in time past the Inhabitants of Cornwall for the most part dwelling on the Sea-coast, inasmuch as the poorer sort were fed with Fish, became very obnoxious to Leprous Distempers; inso-much that for their relief many Hospitals were erected in that Countrey. That I may hint in a few words the reason hereof, I am apt to think whether that food is rancid,

Irregularities in Diet.

The daily eating of Pork or Fish.

The reason thereof inquired in to.

or

or otherwise impropportionate, that it conveys particles not rightly mixed, nor easily to be subdued to our blood, which being so heterogeneous and largely heapt up by a long use of such Diet, the saline particles of which kinde do easily associate themselves, and so do constitute Tartarous Coagulations to be exterminated in the skin, and the seeds of the Leprosie or of the Impetiginous Evil.

*It often follows
the Pox and
Scurvy.*

But yet a plentiful Crop is begot from the taint of the Scurvy and Pox left in the body, and afterwards by the combination of Salts and Sulphur exalted to extremity. We have elsewhere discovered the reasons of the former disease, and especially of the foresaid symptome coming after it, which being accommodated to our present Hypothesis do make it more clear. And it so often happens, that pustulous eruptions of this sort do follow an inveterate Pox, although it seem to be cured, that none distempered almost with these, wants the suspicion of that shamefull Disease; so that the first Question of a Physician in such a case being consulted, is, Whether the Patient have not at some time formerly contracted that Distemper? For surely the Corruptions of the blood, after they are by a long stay become altogether heterogeneous and indomitable, at length acquire to themselves salt Particles, wherewith growing into such like Tartarous Concretes, and being thrust forth into the skin, produce those Impetiginous Pustules.

Its Prognosticks.

As to the Prognostick part of this Disease, although it seldom threatens death or imminent danger, yet after it hath taken deep root, the Cure is very difficult, if at all: The Impetigo first beginning, and exciting a few Pustules, and knots of them, perhaps in one or two members, sometimes admits of Cure, but hardly without a most efficacious remedy. But if the Disease proceed so far, that the frequent and broad clusters of wheals appear dispers'd throughout the body, then small remedies effect nothing, and the great ones howsoever diligently observed, will not easily perform a Cure. But if the Disease, maugre all remedies advance daily, and encrease at length into a Leprosie, *Celsus* judges it impossible to be cured, and therefore we must wholly abstain from it.

The Cure.

Two chief Indications.

There are two chief Indications concerning the Cure of an Impetigo, *viz.* Preferatory, which respects the cause of the Disease, and the Curatory, which relates to the symptomes, *viz.* the pustulous Eruptions. The vital Indication hath seldom place here, unless in a desperate condition, where sleep and strength fail. The Method of Curing ought to begin with the Preferatory Indication, which takes away the Causes of the Disease by inward remedies, for otherwise external (as in the Pfora) are never administred with success; but the roots of the disease in the blood being cut off, the cutaneous sproutings quickly consume away: for the taking them away, we must proceed in one manner when the Impetigo begins by it self, and in somewhat a different manner when it follows an inveterate Scurvy or Pox, being ill or not at all cured. We will consider each case thoroughly by it self, and distinctly.

How to be cured, the Disease beginning of it self.

The evident causes to be first removed.

Therefore whensoever this Disease is simple, and primarie, and being yet New, let the evident and extern Causes be removed; let the manner of Diet, and unwholsomeness of Air be corrected; therefore those that have been lately too much accustomed to salt Diet, and the flesh of Pork and Fish, let them change to Diet of good Juice and easie digestion. They that inhabit the Sea-coast, or Fenny places, let them remove to a dry and clear Air; in the mean while let no less care be had to their Drink, by declining thick and foggy Ale, and small and acid Wines too much abounding with Tartar: at length let care be taken lest their Drink or Food be dressed with any mineral waters that are apt to petrifie.

The conjunct causes how taken away.

Secondly, In respect of the conjunct and procuring Cause, there are two chief Intentions of Cure, *viz.* that the impurities of the bowels and humours be quickly purged out; also that the acid saline distemperatures of the blood and nervous Juice be altered (whereby the Tartarous matter may be the less engendred in them;) for these purposes Medicines both evacuating and altering are prescribed of several kinds. Notwithstanding, because not all, but the greatest remedies are here convenient, those which are most chiefly of use and available, are Catharticks, Phlebotomy, Whey, Chalybeate Waters, Juicy expressions of Herbs, Decoctions of Woods, steel'd Medicines and Salivation. Some certain Models of each of these, and the manner of using them, we will annex.

The chief Remedies made known.

1. A Purge.

Wherefore in the first place, universal purging and bleeding being celebrated (as in the Cure of the Pfora) we appoint the following Tincture or purging Infusion, whose dose is from six to eight ounces, to be repeated in six or seven days.

Take

Take of the roots of sharp-pointed Docks dried, Polypodie of the Oak, of each half an ounce, Senna ten drams, Epithymum six drams, Rhubarb, Mechoacan of each half an ounce, yellow Sanders two drams, Celtick Nard half a dram, Salt of Tartar one dram and a half, put them in a glass with three pints of White-wine, water of Elder-flowers one pound, let them stand stop'd in a cold place three dayes, pour off daily as much of the clear liquor as is sufficient.

Secondly, For sweetning of the Blood, and washing of the Salts thereof, let simple Whey, two or three pints, or with the infusion of Fumitory, Chicory, and sharp-pointed Docks, be drunk every morning, for twenty or thirty dayes, if the Stomach will bear it, and likewise evening and early in the morning, let a dose of the ensuing Electuary be swallowed.

Take Conserve of the roots of sharp-pointed Docks six ounces, Crabs-eyes, Coral prepared, of each two drams, Ivory one dram, Powder of Lignum Aloes, yellow Sanders, of each a dram and a half, Sal Prunella two drams, Vitriol of Mars a dram and a half, Syrup of juice of Wood-sorrel what suffices to make an Electuary, the dose two drams.

Thirdly, For the same reason that Whey, your Iron Mineral waters are prescribed for this Disease, and do oft notably help: for when all the other remedies have been in vain, I have with those alone cured a painfull and almost leprous Impetigo. Moreover, for more efficacy sake, let the use of Sal Prunella or Vitriol of Mars, or of the Electuary but now mentioned, be dexterously adjoyned.

Fourthly, In some endued with too much Serum, and a watery Constitution, where the drinking Whey or Mineral waters are less requisite, it is sometimes expedient that a Decoction of the Woods be assumed at physical hours, and also constantly instead of ordinary drink.

Take the Shavings of Willow half a pound, of Sarsaparilla eight ounces, white Sanders, Lignum Lentiscinum, of each two ounces, Shavings of Ivory and Harts-horn, of each six drams, Filings of Tin, crude Antimony, of each four ounces tyed in a rag, of Liquorish one ounce, infuse them in sixteen pound of Spring-water, and boyl them to half, keep it strained for use.

Fifthly, Medicines of Steel, in that they are every where accounted among the more excellent Remedies, are wont seldom to be omitted in this Disease, although not frequently given with success: for most Preparations of Steel, wherein the Sulphureous Particles predominate, inasmuch as they ferment the blood, and irritate it into Critical Effervescences, do cause these impetiginous eruptions to augment rather than diminish; notwithstanding the Salt, Syrup, Tinctures, and infusions of Vitriol, inasmuch as they fix the Blood, and something restrain the raging of the Salts, do fitly enough agree with the intention of Cure now proposed; but being weak in efficacy, they do not prevail against so Herculean a Disease.

Wherefore Sixthly, these and many other Remedies nothing availing, many commend Salivation, as the stoutest Wrestler and only match for such an Enemy. Yet the event doth not always answer this great expectation; for I have experimented this remedy without success in four Patients labouring under a painful Impetigo, which had resisted other Medicines. Some of these were provok'd to abundant Spitting by Unction with Quick-silver, others by doses of Solar Precipitate; which they have endured for the space of twenty dayes; which time being elapsed, all the scaly eruptions and clusters of wheals have vanished; notwithstanding, to confirm the Cure, a Diet-drink of the Decoction of Sarsa was appointed, and frequent sweating under a Cradle, and due purgation between, was continued for a month: Notwithstanding, this Course being finished, when no footsteps of the distemper seemed to be left, within another month a new stock of the same Disease beginning to break out, it increased quickly to its usual maturity. Moreover, when one of them would repeat this course, and another after two relapses would experiment it the third time, both of them at length after great sufferings of Pain despaired of Cure: Whence it is manifest that the Venereal Distemper, although highly malignant, and raising most filthy Ulcers consuming the flesh and bones, is more easily and certainly cured than the Impetigo.

2. Whey.

An Electuary.

3. Steel'd waters.

4. Decoctions of Woods.

5. Medicines of Steel.

6. Salivation.

Salivation does not alwayes cure this Disease.

The

Why the Impetigo is more difficult of Cure than the Pox.

The reason whereof if we enquire, may plainly be conceived, for that the cause of the latter Disease consists in a malignant and altogether heterogeneous pollution, infecting and poisoning the blood and nervous Liquor for a certain time, but not altogether overthrowing, or for ever depraving its temperament; wherefore the Cure is performed by Salivation, or a sudorific Diet, eradicating all that venom, and then the natural disposition of the blood and humours remains entire: But in a more difficult Impetigo, the Elemental particles and first Constitutives of the blood are corrupted, inasmuch that unless the natural disposition and constitution of these are restored, all Evacuations and Expurgations of any venomous, malignant and heterogeneous matter, however plentiful and eradivative, do little or nothing prevail. Wherefore, many famous Physicians not undeservedly judg'd this Disease being confirmed and raised to the borders of a Leprosie, to be hardly or never cured.

Impetigo succeeding a Scurvy, how to be cured.

Secondly, No better event attends this malady ensuing upon an inveterate Scurvy; perhaps hence the intentions of healing are a little more certain when this Distemper is placed as the Basis or root of that; to wit, that the chief curing Indication being taken from thence, we must chiefly insist upon Antiscorbutical remedies; but the more sharp and hot of this kind, as the Garden Scurvy-grass, Water-cresses, the Horse-rhadiſh, Pepperwort, and others too much irritating the blood, inasmuch as they dissolve the temperament thereof more, and drive out more plentifully the Tartarous Coagulum to the skin, are always discovered to be more prejudicial than advantageous; and for this reason the use of Baths, or bathing in hot waters, which namely evacuate the humours of the whole body by an abundant Evaporation, and cleanse the pores of the skin, and seem very available in this malady, often-times are so far from helping, that those Eruptions are wont to be exasperated from thence and very much encreased: for I have known many not extremely Impetiginous, to have gone to our Baths, to bathe in the hot waters, that have returned altogether Leprous. Wherefore, when the Symptoms of this distemper arise from a scorbutick evil, all elastick things are to be avoided, and only the more temperate, endued with a Nitrous, Vitriolic or volatile Salt, are to be administered. We will lay down some Models of each sort; As first Crystal Mineral, Juices of some Herbs and Decoctions, Salt and Mineral purging Waters, are most predominant with a Nitrous Salt.

Hot antiscorbuticks do not agree.

Not Baths.

But only the more temperate Remedies endued with a nitrous, vitriolic or volatile Salt.

Forms of Nitrous Medicines.

Take of Crystal Mineral, or Nitre purified one ounce, Flowers of Sal Armoniack one dram, bruise them in a glass Mortar, give one dram three or four times in twenty four hours.

Water of Sow-thistles.

Take of the leaves of Housleek the greater two handfuls, bruise it and boyl it in two pound and a half of new Milk till it turn to Curds and Whey, strain it, and take a pint of the clear liquor twice in a day.

Cucumbers.

Take of the leaves of Dandelyon six handfuls, bruise them, and put them into a glazed earthen pot with a cover, which put in an Oven after the bread is drawn out, let it stand six or seven hours, then pour it through a Strainer, the dose is four ounces to six of the clear liquor, thrice or oftner in a day.

Cucumbers being endowed with a Nitrous quality are advantageous by experience against this disease, wherefore in lieu of a Sallad let them be plentifully and often eaten; moreover three or four of them cut into slices, let them be infused, and stopp close, in three pints of Spring-water all night; to the clear liquor poured out, adde Sal Prunella two or three drams, the dose is half a pint thrice or oftner in a day. For the same purpose Decoctions of the leaves in running water together with the fruit do profit.

Purging Mineral Waters.

1. Certain mineral purging waters, of which sort are chiefly those of North-hall, an Analysis being made by Evaporation, manifestly shew a Nitrous Salt with which they are imbued, and I have sometimes found the daily drinking about four pintes for many dayes, to help against a gentle Impetigo.

Vitriolick acide waters.

2. But as I have before hinted, those Mineral waters endued with a vitriolic Salt, of which kind are the SPAW, and Tunbridge, and Astrop Wells, do far excell those Nitrous, and all other Remedies, and do more prevail in the Cure of an Impetigo. To those Patients that have not the opportunity of using these waters, I used to give with good success against this disease common water impregnated with our Steel

and so rendring most exactly the gust of those Mineral waters. By reason of the Mineral Salts, or at least the Mercurial Particles in them, Tin and Antimony are oft in use in the Cure of the Impetigo, and are usually prescribed with other remedies. Let the Filings of Tin, and Powder of crude Antimony, be infused in Ale for ordinary Drink: also Decoctions of *Sarsa* made with the woods, are found beneficial against this Distemper.

Medicines of Tin and Antimony.

3. The use of a Viper, and the Preparations thereof, doth enough commend the wonderful vertue of volatile Salts in a grievous Impetigo, and also in curing the Leprosie it self. This Antidote of that Disease is reported to be found out first by a casual experiment, inasmuch (as *Galen* reports) that drink being pour'd out of a Bottle wherein a Viper was put to poyson one labouring with an Elephantiasis, and so given him to free him from his misery, prov'd his remedy, and what was destined for his murder; dispatched an incurable Disease. Hither relates the Analogy, taken from the nature of this Animal, whence they collect that it helps in this Disease: because the Viper yearly shakes off his scaly Coat, therefore some think its particles prevalent to throw off the leprous skin of a diseased man; but though we do not attribute much to these things, yet it is manifest by frequent observation, that remedies of a Viper do profit in the Impetigo and Leprosie; the true reason whereof ought to be ascribed much to the volatile Salt wherewith this Animal is endued. For the particles hereof destroy the fixt and acid Salts predominating in the blood of the diseased, and dissolve their combinations; notwithstanding, the Salt, Spirit, and Oyl chymically extracted out of Vipers, by reason of their elastick particles, contracting an Empyreuma from the fire, profit not in this disease; as also neither Spirit nor volatile Salt of *Harts-horn*, *Soot*, *Blood*, and other the like *Armoniacks*; because by violently stirring the Blood and Humours they rather dissolve their temperament, and thrust forth the Corruptions more plentifully into the skin. Wherefore the more simple Preparations of Vipers, as broths from their flesh boil'd in water, and Drinks impregnated by Infusions, and Decoctions, and powders being made of them dried and beaten, are prescribed more successfully against this Disease. Moreover not only the boyl'd flesh of Vipers, but of any other kinde of Oviparous Snakes being taken in lieu of ordinary food do oft afford notable relief.

3. *Medicines endued with a volatile Salt.*

Chiefly prepared of Vipers.

But not chymically.

Broths and infusions of Vipers.

4. The Impetigo or scaly eruption of Pimples, and formed as it were into clusters, is so frequent and familiar a symptome of an inveterate Venereal distemper, that we first ask the Patient whether something of that malignity be not concealed of which they are conscious; and if we perceive the matter such, all Specificks against this Disease, and Antiscorbuticks being omitted, we must come to the Decoctions of Woods, and those little or nothing helping, we must descend to the use of Quick-silver. And truly by this method I have cured many that were accounted Impetiginous and Leprous, (who have been handled long in vain, and wretchedly vexed with other Remedies appropriate to these diseases:) But we referre this sort of Impetigo to the Pathology of the Venereal distemper, whereto it is an Appendix.

4. *How the Impetigo following the Pox is to be cured.*

II. The second Indication curatory relating to the Disease it self, and the primary symptom, to wit, the scaly eruptions and clusters of Pustules, prescribes Topical Remedies to be applyed to the outer skin for the removing these effects; for which purpose in the first place Baths and Liniments are convenient: which yet rarely or never help of themselves, unless the procuring cause, that is, the Tartarous disposition of Blood be first purged out.

The second Indication Curatory.

There is a vast medley of Topicks of this sort vulgarly vented, as well by Physicians as by Empiricks and Quacks; among all which notwithstanding, Baths or Liniments compounded of Tarre do far excell all other Remedies of either kind, inasmuch that we should only use these, but for their ill favour; wherefore we will annex some models of Compositions both with and without Tarre.

Topicks of Tarre are the best.

Wherefore, for Baths it is common to take water out of Tubs wherein Tarre hath long stood, and impregnated with the infusion thereof: Or,

Take of Tarre two pound, and with white Ashes sifted incorporate it into a gross mass, which boyl in a sufficient quantity of Spring-water, adding leaves of Ground-Ivy, Fumitory, white Horehound, the roots of sharp-pointed Dock, Enula-campane, of each four handfuls, make a Bath to be used with government; Or let such a Decoction be prepared without Tarre for Patients abhorring the smell.

A a

1. Sul-

Baths as well Natural as Artificial are found by experience less appropriate for the most part the former do prejudice; Moreover, every bathing ought to be administered: for because this administration exagitates the blood, and to an Effervescence, its Temperament is endangered (as has been said) rather dissolved, and the corruption to be spread more plentifully over the skin.

Liniments whose use is more safe, and convenient, are of a Triple kind or three, viz. Gentle, Indifferent, and most Strong; of each of these we will produce one or two patterns.

1. Mild Liniments.

1. First therefore in a slighter Impetigo, when the Eruptions and Clusters are small, Fasting Spittle is commended; likewise the weeping of green Wood in the Fire, also mere rubbing them with roots of sharp-pointed Docks bruised and macerated in Vinegar: Or,

Take Oyl of Tartar per deliquium, Oyl of Nuts or Almonds by expression of each equal parts, make a Liniment to be used to the parts affected twice in a day.

2. Stronger, of Tarre.

2. Liniments of the Second kinde have Tarre for an Ingredient, which is esteemed above all.

Take of Oyntment of Roses six ounces, of Tarre two ounces, melt them together: Or, Take a fat piece of Weather-mutton, which stick with the roots of sharp-pointed Docks, spit it and roast it, and in the mean while baste it with Tarre dropt leisurely upon it; the Dripping being received in a Vessel under it, keep it for an Oyntment most excellent for an Impetigo.

3. The strongest of Mercury.

3. The most prevalent Liniments are Mercurial, viz. those made with Quick-silver or Præcipitate. Let the model of the former be that prescribed already against the Scab; for the other,

Take of white Præcipitate three drams, Oyntment of Roses three ounces, mix them, for to anoynt the parts chiefly affected.

The use of these ought chiefly to be suspected in this Malady; for if spitting be raised, that great glut of matter impacted in the pores of the skin will be moved, which if the whole together rushing too much towards the *Ductus Salivales*, gather about the parts of the Throat, will endanger suffocation.

A notable Relation.

Some years since a Virgin of a Noble Family, being of a hot Temperament, and endowed naturally with a sharp and salt blood, after being a long time obnoxious to an Impetigo, almost from her Cradle, about her riper years began to be afflicted more grievously; for the clusters of scaly Pustules covered not only her Arms and Thighs every where, and the other covered parts of her body, but also her Hands and Face were so defiled, that she was ashamed to appear abroad or converse with others of her rank. Lesser remedies almost innumerable were exhibited without success; by using Baths she at first appeared relieved, but at length grew worse thereby. *Astrophe* Wells which have cured some, afforded her little or no relief. Wherefore, when all ordinary means would not effect any thing, I propounded Salivation, as a remedy more prevalent than all the rest and (as it is accounted) the last. When the Parents and Patient readily consented to this advice, preparing her body duely by Purgation and Phlebotomy, I gave her (after our manner) Pills of Solar Præcipitate two dayes, and after the interval of one day, the remedy being repeated the next, an abundant and laudable spitting began, and continued for a month without any ill symptom; to keep which in its due tenour, I applyed a Mercurial Oyntment to the bending of the Joynts and the places most affected one while to one, another while to another. Before the finishing of this course, all the Eruptions vanished; notwithstanding to confirm the Cure, as also for the extirpation of the Mercury, she remained another month in Purging, Sweating, and Diet of the Decoction of *Sarsa*, *China*, &c. in which time seeming perfectly cured, she so remained for about forty dayes. But afterwards though she observed an exact course of Diet, the same disease began to bud forth again, and leisurely encreasing, at length it advanced into its former state. I being confounded with this event, perswaded her to hope an alteration for the better after her Menstrual Flux, which was suddenly expected. Notwithstanding,

Salivation cures for a time the Impetigo, but with a relapse.

withstanding, after long delay that Crisis at length happening, and managing her self regularly after it, brought no Cure or ease of that Disease, but rather a fresh assault. Whereupon recourse was had again to Physick, and divers Remedies assay'd, all which when they became frustrate, her friends importuned that she might salivate again, to wit, allured by this hope, that that method which cured her for a short space, being administer'd again, would cure her either for a longer space or altogether. Wherefore according to their wishes, the same course of spitting and sweating repeated for two months space, and thereupon the Pustules every where going off, the Noble Virgin seem'd again wholly to recover her health. But within a fortnight after the course finished, the Pustules and their Clusters again appeared, and leifurely encreasing daily in number and bulk at length grew fouler than before, insomuch that like an *Hydra*, after the loss of one head this disease received sevenfold.

That remedy repeated, did not thoroughly cure the Disease.

I knew another strong man endowed with a lusty habit of Body, who after he had laboured with an *Impetigo* many years, the malady still encreasing, and being advanced to the highest, he was covered all over with a white Scurf, as it were leprous, that every night the Scales fell off like Bran in great plenty in his bed, and might be gathered up in heaps. This man for Cures sake first tryed the ordinary Remedies of every kinde, notwithstanding without success; and afterwards trying a lighter Salivation, found himself nothing better: but afterwards the same method being repeated, by a long and painful Spitting, he seemed to be restored to health; but within three months the same disease budding out, in a short space arrived to its former outrageousness; Moreover, when he had undergone the third time that most painful Remedy, that affect, which seemed expulsed for a certain time, returned again; and afterwards maugre this and all methods, it exercis'd its Tyranny during the Patients life. It will not be requisite here to discourse any thing of the *Lepra*, which being only a more intense degree of the former Malady, for the most part admits of no Cure. As to what relates to other Tumours, and their manifold kinds, and the *Ætiologies* or Reasons of each, I confess I am scarce able to contain my self, but that I should enter upon that pleasant Field of Speculation. But this seems as irrational and unusual, as for one wearied with a long Course, and breathless at the end, running beyond his Post, presently to begin a new Race.

FINIS.

Baths.

Sulphureous Baths as well Natural as Artificial are found by experience less appropriate, yea for the most part the former do prejudice; Moreover, every bathing ought cautiously to be administered: for because this administration exagitates the blood, and puts it into an Effervescence, its Temperament is endangered (as has been said) rather to be dissolved, and the corruption to be spread more plentifully over the skin.

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Some years since a Virgin of a Noble Family, being of a hot Temperament, and endowed naturally with a sharp and salt blood, after being a long time obnoxious to an Impetigo, almost from her Cradle, about her riper years began to be afflicted more grievously; for the clusters of scaly Pustules covered not only her Arms and Thighs every where, and the other covered parts of her body, but also her Hands and Face were so defiled, that she was ashamed to appear abroad or converse with others of her rank. Lesser remedies almost innumerable were exhibited without success; by using Baths she at first appeared relieved, but at length grew worse thereby. *Astrophe Wells* which have cured some, afforded her little or no relief. Wherefore, when all ordinary means would not effect any thing, I propounded Salivation, as a remedy more prevalent than all the rest and (as it is accounted) the last. When the Parents and Patient readily consented to this advice, preparing her body duely by Purgation and Phlebotomy, I gave her (after our manner) Pills of Solar Precipitate two dayes, and after the interval of one day, the remedy being repeated the next, an abundant and laudable spitting began, and continued for a month without any ill symptome; to keep which in its due tenour, I applyed a Mercurial Oyntment to the bending of the Joynts and the places most affected one while to one, another while to another. Before the finishing of this course, all the Eruptions vanished; notwithstanding to confirm the Cure, as also for the extirpation of the Mercury, she remained another month in Purging, Sweating, and Diet of the Decoction of *Sassa, China, &c.* in which time seeming perfectly cured, she so remained for about forty dayes. But afterwards though she observed an exact course of Diet, the same disease began to bud forth again, and leisurely encreasing, at length it advanced into its former state. I being confounded with this event, perswaded her to hope an alteration for the better after her Menstrual Flux, which was suddenly expected. Notwithstanding,

Salivation cures for a time the Impetigo, but with a relapse.

withstanding, after long delay that Crisis at length happening, and managing her self regularly after it, brought no Cure or ease of that Disease, but rather a fresh assault. Whereupon recourse was had again to Physick, and divers Remedies assay'd, all which when they became frustrate, her friends importuned that she might salivate again, to wit, allured by this hope, that that method which cured her for a short space, being administer'd again, would cure her either for a longer space or altogether. Wherefore according to their wishes, the same course of spitting and sweating repeated for two months space, and thereupon the Pustules every where going off, the Noble Virgin seem'd again wholly to recover her health. But within a fortnight after the course finished, the Pustules and their Clusters again appeared, and leisurely encreasing daily in number and bulk at length grew fouler than before, inasmuch that like an *Hydra*, after the loss of one head this disease received sevenfold.

That remedy repeated, did not thoroughly cure the Disease.

I knew another strong man endowed with a lusty habit of Body, who after he had laboured with an *Impetigo* many years, the malady still encreasing, and being advanced to the highest, he was covered all over with a white Scurf, as it were leprous, that every night the Scales fell off like Bran in great plenty in his bed, and might be gathered up in heaps. This man for Cures sake first tryed the ordinary Remedies of every kinde, notwithstanding without success; and afterwards trying a lighter Salivation, found himself nothing better: but afterwards the same method being repeated, by a long and painful Spitting, he seemed to be restored to health; but within three months the same disease budding out, in a short space arrived to its former outrageousness. Moreover, when he had undergone the third time that most painful Remedy, that affect, which seemed expelled for a certain time, returned again; and afterwards maugre this and all methods, it exercis'd its Tyranny during the Patients life. It will not be requisite here to discourse any thing of the *Leprosia*, which being only a more intense degree of the former Malady, for the most part admits of no Cure. As to what relates to other Tumours, and their manifold kinds, and the *Ætiologies* or Reasons of each, I confess I am scarce able to contain myself, but that I should enter upon that pleasant Field of Speculation. But this seems as irrational and unusual, as for one wearyed with a long Course, and breathless at the end, running beyond his Post, presently to begin a new Race.

FINIS.

TRACT OF THE SCURVY.

CHAP. I.

THE CONTENTS.

A Description of the Scurvy. The Internal and nearest Cause of it is chiefly in the Blood, and also in some part radicated in the nervous Lignor.

THere is so rare Mention, and so slender Description in the ancient Medicine of this Disease, which we call the Scurvy, that some have doubted, whether there were in the times of old any such Sickness, though now epidemical in many places, and almost every where ordinary, and with which every one is trouble, or at least thinks himself troubled with it; and which like the Pox and the Rickets, is derived a great way down to the Children: but certainly it is plain by the testimonies of *Hippocrates, Aretæus, Pliny*, and others, that this Affection though known by other Names, was taken notice of by the Ancients, and that its cure hath been treated of though after a slender manner.

Being not very solicitous concerning the appellations of this Disease, we will presently proceed to the knowledge and application of its Nature: which as it is so diffuse and extends itself into so various and manifold Symptoms, that it can neither be comprehended by one definition, or scarce by a singular description, it will seem best first of all to recite all the *Phænomena* of this Disease, or to relate the History of the more notable accidents of it, and thence to accommodate a certain *Hypothesis* for the right solving its appearances.

A recital of the
chief symptoms
of the Scurvy:

In the Head.

In the Breast:

In the lower
Belly:

In the outward
Parts.

The evident cau-
ses of the Scur-
vy.

The cause of the
Disease diffused
thorow the
body sticks ei-
ther.

As to the first, there are reckoned up a great company of Symptoms in the Scurvy, and manifold Affections and of diverse kinds; and which sometimes are of an opposite or contrary nature to it: yea if any unusual accident, never before heard of in an humane Body happen, when it cannot be referred to any other kind of Disease certainly, we presently without doubting pronounce it the Scurvy: so that this Disease, like one condemned, and of an evil Name, suffers for others faults: In the mean time it is wont to excite symptoms very many from its own power, which appear almost in every part of the Body, a recital of which will be best performed by a distribution of the parts of the Body. Therefore that we may thorowly handle the marks of the Scurvy, from the beginning to the end, we will begin first from the fountain of it in the Head: and to this belong great and habitual Headaches, and those either by certain fits, or at certain times, sometimes a numness or stupidness of Spirits, sometimes pertinacious Wakings, frequent Giddinesses, and Swimmings in the head, Convulsions, Palsies, plentiful Spittings, Ulcers in the Gums, a looseness of Teeth, a stinking in the Mouth. Secondly, sometimes in the region of the Breast, pains in divers parts of its membranes, and chiefly about the *Sternum*, which being often sharp and piercing, do miserably torment those labouring with this Disease night and day, a frequent *Asthma*, difficult and unequal breathing, a straitness of the Breast, a striving with an empty Cough and inordinate Pulse, a trembling of the Heart, frequent Swoonings, and often faintness of Spirits, or a fear of it almost continual. Thirdly, this Disease, as it were fixing its chief seat in the lower belly, produces an Iliad of Diseases: for often they have Nauseousness, Vomiting, Belchings, gnawing at the Heart, Inflammations, and grumbling of the *Hypochondria*, often Colicks, and troublesome Grievings running up and down here and there, almost a continual *Diarrhoea* or Looseness, sometimes a Dysentery or Flux, or a desire of going to stool, a wasting away of the Flesh, and sometimes an *Ascitis*.

The Urine, for the most part red and lixivial, with a crustiness swimming in it, or else sticking to the urinal: sometimes also by fits it is pale and watery and in abundance. Fourthly, besides these Affects of the Belly, there are wandering pains and those not seldom highly painful, and troubling chiefly at night in the external Members, yea thorow the whole habit of the Body they feel a heaviness and spontaneous weariness, a wasting of the Flesh, an ach about the Loyns, and a debility and enervation of other Members; in the Skin spots of several colours, Tumours, Pimples, and often venomous Ulcers shew themselves about the Muscles; a Numness, Stiffness and pricking, and as it were the ascension of a cold air, Also Contractions, and leapings of the Tendons: Besides, to scorbutical Persons happen inordinations of the Blood, uncertain Effervescencies, wandering Intemperaments, erratick Fevers and great Hemorrhagies. Besides these more common and accustomed symptoms of the Scurvy, of which some have more some less, and which infect them now after one manner, and now after another manner, and in another kind, oftentimes there happen other unaccustomed and prodigious accidents to this Disease.

For the more full knowledge of this Disease, it seems good that we here observe as it were lightly, what concerns the original, beginning or first invasion of it. For we are to inform you, that the Scurvy may be produced by reason of several Causes and occasions: for although an ill course of Diet, a sedentary life, the inordination of the Spleen, and the Crudities heaped up in the first passages are very much accused; yet there is wont to be a further cause, as the unwholsomeness of the Air, and the evil *Crisis* of the Blood, vitiated by former Diseases: wherefore the Scurvy or Scorbute is often venacular or peculiar to marshy places, and to the Sea Coasts: and frequently falls on those who much use the Sea, and feed much upon salt and smoak-dry'd Meats, and who are forced to drink putrefied Water: and often succeeds to continual Fevers, and to other chronical Diseases ill cured; also to great Hemorrhagies and other evacuations; and to usual excretions, as the Piles and monthly courses being suppressed: Moreover this Disease, without any great forerunning cause, is excited not seldom by contagion, and sometimes is also hereditary.

It manifestly appears, from what we have observed concerning this scorbutick Affection, that the material cause of this Disease is not contained in any private place or singular mine, but is diffused thorow the whole body and every part of it, both within and without: from whence we gather that the scorbutick Miasm or Contagion

Contagion, is poured forth, either in the Blood or in the Nervous Juice or in both: And indeed, the eruptions of Spots, and little wheles, the redness, and as it were lixivate urine, or like lie, plainly testifie the Contagion to be placed in the effervency and inordinatness of the Blood; to which another like prognostick may be added, the divers production of this disease, which for the most part succeeds the depravation of the mass of Blood: no less do the troublesome dolours, both within in the Membranes, and without in the Muscles, the debility of the Members or resolutions, the *Vertigo*, Cramps, and frequent faintings of the Spirits declare the fault or vice to be in the nervous Juice. Therefore, when both the general Humours are in fault, we will see which is first and chiefly vitiated, and from whence it draws its Contagion, and by what means it communicates its harm to another humour, and to any other parts, that are wont to be affected.

To the blood or
to the nervous
Juice or to both

As to the Blood (in whose mass the Scurvy seems most of all to be rooted) we have elsewhere shown, that its disposition is even almost of the same temper, and of such like particles composed, as Wine: for that we have hinted, the Blood, even as Wine, to be sick, chiefly from two causes, that wit, either, because that there is something extraneous, and not to be truly mingled with it; poured into one or the other, or else because the disposition of the Liquor, or its temperament is perverted, that is, for as much as some things that are to be in Subjection, either to one Element or to another, and which ought to be subjugated, are exalted.

The Dyscrasie of
Blood and Wine
Compared.

As to the first we have observ'd of some, that when the faces, are first secreted, and thrust up from the bottom, they are by being moved, lifted up, or if any exorick thing be cast into the Pipe, as Sewet or Sulphur, presently a notable perturbation is stir'd up; by which, unless it be soon quieted, the whole *Crafsis* of the Wine will be in danger to be subverted. In like manner, there are many things not miscible, which disturb the Motion and Circulation of the Blood, by being poured into it; and hinder it, that it cannot perform its due economy; the nutritious Juice being full of the feculences, does inordinately ferment the Blood, and as we have formerly shown, that Liquor becoming degenerate, stirs up the paroxysms of intermitting fevours; the vaporous Recrements of the Blood, the serous, bilous, and melancholy being retained in the bosom of it, bring forth Catarrhs, Dropsies, Jaundice, Melancholy, and many other Diseases: but if that extraneous thing be removed in time, it soon, even as Wine freed from its extraneous mixture, recovers its pristine Condition. But either Liquor, being for a long time infected with those heterogeneous contents, so that the due *Crafsis* is at length degenerate, it is not then easily to be restored.

As to things not
miscible - pour-
ed into either.

2. Besides, both Wine, and Blood, by reason of many other causes, depart from their right Temperament. As to Wine there are many ways and reasons whereby its Liquor is perverted from its legitimate disposition: which may also be parallel'd, by as many, if not more, in the dyscrasie of the Blood. (For this is often wont to be suddenly, empoysn'd and broken, which does not easily happen to Wine) 1. Therefore, we may observe of Wines, that they do not sometimes attain to maturity, but for want of Spirit they remain crude, for as much as the Spirits, and the other active principles of Sulphur and Salt being overwhelmed with more thick and gross parts, cannot extricate themselves; wherefore they become without Spirit, but having a thick consistence, and ungrateful taste, degenerate into a tasteless Wine: and almost after the same way it is, when the Blood, the Spirit, and Sulphur depressed, becomes crude and watry, and without Vigor, and unable to be inkindled afresh in the Heart. And this kind of disposition of the Blood *Horstius* affirms to be the cause of the scorbutick affection; but this same disposition, seems rather to infer the *Pica*, or strange longings of women with child, as also the Dropical disposition, than the Scurvy, as we shall shew more at large anon. 2. The sulphureous parts of Wine being exalted above the rest, cause an immoderate effervescency or ebullition in the Liquor, and is called in our idiom or proper Speech, *Fretting of Wine*: In like manner, the sulphureous parts of the Blood being too much provoked or carried forth, causes a feverish intemperance, and is apt to be inflamed in the Heart, and indeed is the cause of very many fevers together. 3. Not seldom the Spirit in Wines growing weak

As to the tem-
per of either va-
riously altered;

The Scurbutick
Dyscrasie of the
Blood like
Wines when
they become.

Fretted or Ropy

and the Sulphur being bound up, the saline part being carried into a flux overcomes the rest; wherefore the Liquor becomes sour. The famous *Seimernth* thinks the Blood in the Scurvy to be altered as Wine degenerated into Vinegar, which we shall shew by and by, to be otherways. And we have formerly shewed, the dyscrasie of the Blood, being grown sour, causes Melancholy. 4. There yet remains another ill disposition of Wines, to which we may very aptly compare the scurbutick Disposition of the Blood, to wit, when the Spirit being depressed, the sulphureous and the saline Particles being combined together, are exalted, and as this comes to pass in Wines, after a two fold manner, so also by the like affection of the Blood we may deduce from thence a two fold Kind of Scurvy, as we shall shew more clearly anon. It is then a common observation in Wines, that besides their degenerating into a tasteless Liquor, and into sour Vinegar, they do sometimes, the Spirit being depressed, and the Sulphur and Salt being together exalted, become rancid, or ropy, or mucilaginous; in proper terms, *Wines that are fretted, or ropy*. In either mutation, the Spirit being subjugated, the sulphureous and the saline Particles being associated together, exceed the rest of the Elements, and cause the disposition of the Liquor, to become of their Nature. But yet the business is not performed, altogether after the same manner, in both: for that in the former dyscrasie of the Wine the Sulphur is something more potent, than the Salt, but in the latter the Salt exceeds the Sulphur: so that either of them being the stronger, their Lord, the Spirit, being cast off; they agree one with the other, and surmount the due tenour. The reason of either, may seem to be unfolded after this manner.

When generous Wines have grown hot for a long while, the particles being much agitated and striking one against another, the Spirit partly evaporates, and partly overwhelmed in the more thick Elements, is suppressed: In the mean time, the Sulphur (of which there is the greater plenty) being more carried forth by the agitation, and so casting off the yolk of the Spirit, adheres to the Salt, and lifting that up, alters the mixture of the Liquor, which by reason of the rising up of the Sulphur combined with the Salt, becomes rancid, or fretted: In like manner, when thin Wines have been kept long, the Salt is carried forth, and depresses the Spirit, overcome by its *fluor*, and so subjected by its watrishness, the Liquor becomes sour, or sharp; after that the Salt growing eminent, the Sulphur (of which there is a less quantity) cleaving to it, and intimately uniting, converts the Consistency of the Liquor from thin to thick, and as it were of an oily substance, and from an acid, sour taste to a very ingratefull, and as it were musty.

It is probable that after the same manner the Blood is altered in the affection of the Scurvy, as Wines, as often as they become too hot, degenerate into fretted and ropy; for it is an argument, that this disease does not depend so much on the feculencies mixed with the Blood (though such should be there, they might be at last driven forth, and their supplies cut off) but on the habitual dyscrasie of the Blood; because the Scurvy being radicated, is so difficult and sometimes not at all, to be cured. Moreover we may affirm, the dyscrasie of the Blood which causes the Scurvy, to be two fold, as of the Wine, to wit, a sulphureous-saline and a saline-sulphureous disposition. For as there are very great variety of affections, which are stirred up by the Scurvy; yet all of them may be aptly enough reduced to two principal Heads, or as it were two Fountains of evil, to wit, first, that the blood being touched with the scurbutick Miasm or Contagion, becomes either very fervid or hot, in which the Sulphur having dominion, associates it self powerfully with the Salt: wherefore it being made more rancid or fretting, grows inordinately hot in the vessels, and perpetually sends forth from it self adust recrements, to wit, concretions of Sulphur and Salt, and disperses them here and there, which spreading outwardly, produce spots, pimples, wheals, or ulcers: but being inwardly layd up, bring forth a disposition to Vomit, pains about the heart, Looseness, Fluxes and grievous pains. In this kind of Scurbutick rancidity or frettedness of the Blood, temperate Remedies only are convenient, and often Blood-letting, Scurvigrafs, Horse-radish, or other things endued with a sharpness and incitation: even by the like means as fretted Wines are cur'd, by discharging them from their *feces*, and by pouring into them, Milk, Flower, or Starch, Grew, or other Demulsions or Sweetnings this is helped. Or in the second place, in blood

nourishing

nourishing the Scurvy, Salt has the chief dominion, and associates Sulphur to it self: wherefore it is not so fervid, but like ropy Wine becomes thick and mucilaginous, and is slowly circulated in the Vessels, and is apt to stuff the *Viscera* in its passage, and to affix there its feculencies as it were mud. Those affected after this manner, for the most part without any pustulae or eruptions of the skin, become sluggish, breathless and feeble, and labour with spontaneous weakness and straitness of the Breast; and are found to be obnoxious to the passions of the Heart, the *Vertigo*, and *Convulsions*: In the scorbutick disposition of this kind, more hot Remedies, and such as are indued with a volatile Salt; yea Chalybeates or steel Medicines, which may fuse and agitate thorowly the Blood, are wont to be most used, and are to be handled even after the same way, as ropy Wines, to wit, to be soundly shaken and agitated; and also to them are put Lime, burnt Allum, *Gypsum* or Plastering, Sea salt calcined, and the like indued with an high acritude or sharpness. So much for the beginnings of the Scurvy radicated in the Mass of Blood: There yet remains to be unfolded, for what causes the Blood degenerating from its proper nature, conceives this or that morbidick disposition, bringing forth the Scurvy. But it first behoves us to shew by what means the seeds of this Disease lye hid in the nervous juice, the other general humour.

We have elsewhere declared that from the Blood driven to the confines of the Brain, there doth distil a subtle Liquor, both for the matter and for the vehicle of the animal Spirits, and that it doth disperse it self every where thorow the *Encephalon* and the nervous Stock: This *Latex*, so long as it is right and good, consists chiefly of Spirit and Salt combined or volatilised in it, and with these and the *modicum* of Water, wherewith they are washed, there seems to be little need of Sulphur and Earth: but yet this concretion of Spirit and volatile Salt doth indeed constitute the most precious humour which penetrates, passes thorow, actuates, and irradiates all things, concerning which the Chymists have dreamt of their *Alchaest*. At the beginning of the Scurvy, whilst the *Crisis* of the Blood and the tone of the Brain are not thorowly vitiated, this watring liquor of the Brain and Nerves, being as yet spirituous, sweet, and not very unfit, performs all the functions to which it is destinated: but afterwards out of the bloody Mass made poor and very much weakned, a much thinner *Latex* and inclining towards Vinegar drops forth: and further, from the feculentated Blood and as it were rancid or fretted or ropy heterogeneous Particles and very much infested are carried to the animal Regiment, and that being made weak within the brain, they are admitted without repulse, and thence poured forth with the moistning Juice on its *Appendix*, both medullar and nervous: and from hence in several Regions of the flowing animal Spirits, sometimes faintings and wanting of strength, sometimes painful and spasmodick, or cramplike distractions, and explosions do follow. Wherefore a *Paralysis* or Palsy, *Convulsions*, *Vertigo* or turning round or giddiness in the head, tremblings, and other preternatural Affections of the Brain and nervous Stock, are wont to fall on those who have the Scurvy deeply rooted: concerning which we will hereafter speak more particularly. In the mean time we will take notice in general, that the scorbutick Contagion affixed in the nervous Juice, consists in one of these three or in all of them together, viz. that the moistning of the Brain and Nerves becomes much thinner or poorer; or that it degenerates from its saline disposition into sourness; or that it is stuff with heterogeneous Particles.

Hitherto we have shown after what manner the first seeds as it were of the scorbutick Affection are sown in the Blood, and from thence in the nervous Juice. Before we will consider of the fruits or symptoms of the Disease, excited by reason of the evil disposition of either of the humours and the reasons of them, and their manner of becoming so; we must inquire iato the more remote causes and differences of the Disease it self: to wit, that it may appear from what causes or occasions, and by what provision the scorbutick disposition is impressed on the aforesaid humours.

By what means
the scorbutick
Contagion is
impressed on the
nervous Juice.

CH A P. II.

Of the more Remote Causes of the Scurvy, by which its Contagion is affixed on the Mass of blood, and consequently on the nervous Juice.

HAVING shown in the former Chapter, what is the conjunct and nearest cause of the Scurvy, viz. the evil disposition impressed on the Blood and nervous Juice, it now remains, that we inquire into the more remote Causes, by which the Contagion of either humour, and chiefly of that which is chiefly and first in fault, is carried into the Blood: for the depravation of this being detected, it will easily appear, how the morbidick Miasm or Contagion is derived to the other Juice. Therefore as we have determined, that the scorbutick Affection is chiefly founded in the vitiated Blood, and that the evil of it consists, whilst the Spirit is depressed, in that the Salt and Sulphur, as in Wines becoming fretting and ropy, is unduly exalted; we will seriously consider, how this or that disposition is impressed in the mass of Blood.

The opinions of others concerning the original of the Scurvy recited.

But we ought not to pass over what other Authors, diligently searching after the nature of the Scurvy, have determined concerning its Causes and Subject. As there are many opinions of this thing, almost all agree in this respect, that the fountain and origine of this Disease is derived from the fault of the *Viscera*, and the seat of its product is placed in the bloody Mass, to wit, that this being almost only infected with their vitiousness, contracts the scorbutick Contagion. The more Ancient did impute the chief cause of this Disease to the Spleen, not rightly performing its office: but as the office of the Spleen was conceived this thing by some, another thing by others, and a different thing by these; they shewed the production of this Disease after a several manner. *Wierius, Echrius, Albertus, Ronseus, Eugalenus* with many others, supposing that the Spleen was the receptacle of the excrementitious melancholick Juice separated from the Blood, have determined the internal and next cause of the Scurvy, to be a plenty of lutulent or muddy humour, and of melancholy only, or also of that mixed with others, framing a peculiar form of corruption, which abounds about the Spleen and Liver, and in the Veins themselves. This opinion might deservedly challenge our assent, if it had pronounced the secretion of the melancholick Juice from the Spleen being neglected or hindered, to be sometimes and in part the cause of the Scurvy; but that this Disease is held to arise always and altogether from the default of the *Viscera*, is very highly improbable; as will hereafter be made plain, when we shall declare the far more potent causes of the Scurvy. Other Authors attributing the office of sanguification to the Spleen, say that the Scurvy is produced, for that the Spleen does not turn that part of the Chyle destinated to its self, into laudable Blood. But again others as *Reusnerus, &c.* have thought the more humid and watry parts of the Chyle to be prepared in the Spleen, and to be converted into Blood. Therefore they judged the next and internal cause of the Scurvy to be the watry and serous humours, which not being received by the Spleen, were poured on the Blood, and so produced the original of the Scurvy. In the mean time others, as *Platerus, Bauhinus, &c.* sayd that the thicker part of the Chyle being drawn by the Spleen, was the cause of sanguification, and by it to be prepared for it self, and other parts convenient Blood. From this supposition *Gregory Horstius* said the cause of the Scurvy to be the crude and ichorous Blood in the whole Body, but yet chiefly in the *Hypochondria*, offending not only in quantity but with a kind of specifick corruption, proceeding from the imbecillity of the Spleen, viz. because thorow the preternatural Affection of the Spleen, the more crude parts of the Chyle, are not averted from the sanguification of the Liver, from whence the blood in the veins of the Liver and Spleen is first depraved,

depraved, and then by the Commixtion of strange matter the Sanguification of the Liver is hindred, by reason of the object not rightly disposed, for as much as the chyle, by reason of the hurt of the Spleen, was not depurated in its just measure. *Horsf. appen. ad. lib. 2. part. 2. Sect. 1. de Scorbuto.* This opinion easily falls to the Ground, because he asserts, contrary to the Laws of Sanguification, the Spleen to sanguify and to draw the more crude parts of the chyle to it self; when tis well known, there is no passage for the Chyle to the Spleen. Also this mistake is refell'd by the opinion of *Reusnerus* and others, which affirm the next and internal cause of the Scurvy to be the serous and watry humours which the Spleen ought to draw, and by its peculiar office of Sanguification, to convert into Blood.

The most learned *Semertus*, although with the former he attributes also the office of Sanguification to the Spleen, *Institut. lib. 1. cap. 9* yet he derives the cause of the Scurvy otherways than from the fault of this *Viscus*. For he affirms, that by reason of the evil Concoction of the Chyle in the first passages, and being destitute of Spirit, salt and tartareous Feculencies to be heaped up, about the Mesentery and Cawl, and these being continually augmented by the approach of new matter, and moistened by the *Serum*, to be at last transferred into the Spleen and Liver, and from thence into the Stock of the veins, and so in them to infect the whole bloody Mass, and to render it crude and salt. He calls this first Mine of the Scurvy, gathered together in the first passages, a melancholy Humour, which besides he says to be serous, stopped up with pituitous humours, and by reason of its stay in those parts, corrupted after a peculiar manner: Then he adds, that this humour is generated by the fixion of the Spirit and volatile Salt, after the same manner, when as Wine changes into Vinegar.

Several Reasons of no small moment do convince me, that I cannot in all things assent to this opinion; however probable it seems. For besides that this Doctrine does not exactly quadrate with the Circulation of the Blood, since by its Law the humours in the mesaraic vessels are scarcely gathered together apart from the other kind of Vessels, at least there is not any passage for them from thence into the Spleen, moreover it is not rightly determined, that the Scurvy begins only in the first passages; for sometimes it is contracted by mere Contagion. Neither also do we think that this Disease proceeds from the fixeness of the Salt, or from the Crudity of the Blood and humours: for oftentimes it succeeds to long continued Fevers, and that rather seems to proceed from aduision and too great deflagration of the Blood, than from any aduention of the Chyle and other humours in the first passages: moreover sometimes a Sea and marshy air induces this Disease, though no Crudities are begotten about the *Viscera*: and the sick do not complain from the beginning, of their Appetite and Digestion. Indeed wee grant, as to what belongs to the Crudity and the fixity of the Salt, in the Chyme (or second digestion) or the Blood, and defect of Spirit, that from these causes a sickly Disposition is oftentimes produced, but not therefore presently the Scurvy, but rather the *Malacia* of long-ing women, *Pica* of Virgins, the phlegmatick Dropsie, or some other dropical disposition succeed. Therefore since the Scorbutick Aetiology hath been delivered by Authors, to whom the Circulation of the Blood was not known, and agrees less with the Truth, we will open the whole matter with that Key, and to the best of our Skill more accurately unfold the causes, both procatartick and evident, of this Disease, according to the Law of Sanguification.

We have already hinted that there are many occasions and procatartick means from which the Scurvy seems to deduce its original. 1. In some places it becomes national or peculiar, so that the morbidick Contagion is drawn in together with the vital Spirit, by reason of the evil Influence of the Air, and of the vapours, wherewith it is stuffed 2. Very often this Disease follows upon long continued fevers, and other Chronical Diseases and is very deservedly accounted the affects or products of them 3. Sometimes it is hereditary, and is propagated by tradition from Scorbutick Parents 4. Sometimes again it is taken by mere Contagion 5. An evil manner of living, inordinations as to the things non-natural, an innate or acquired Dyscrasie of the *Viscera* sometimes induce a Scorbutick affection, more often contribute to its birth, or nourish the inkindling. We will consider the reasons of every one of these effects.

1. There

The Scurvy does not always arise by the fault of the Spleen or the first passages.

By what means
unhealthfull
Air breeds the
Scurvy.

1. There is none of the ordinary sort of People, but confesses that the Scurvy is very often contracted by the fault of the Air, and it is almost in every bodies mouth, that places near the sea side, marish lakes, and moist places, render the dwellers obnoxious to intermitting Fevers, or the Scurvy: wherefore the sickly, or such who have any regard to their health, do choose their habitations far from such kind of places. Indeed such an humid Air, continually diffusing filthy exhalations and infection, becomes unwholsome in a double respect, and often brings forth the Scurvy, viz. by reason of Transpiration being hindred: and because of the susception of an incongruous Ferment. For in the first place, people dwelling in a thick and not purified Air have the passages and Pores of their skin much closer, or shut up: wherefore when the *Effluvia* of the Blood are not duly exhaled, but the same retained within, ferments the rest of the bloody Mass, and disposes its active particles to various inordinations. Then in the second place, for as much as at the same time filthy vapours, stinking, incongruous Salt and Sulphurs are sucked in, by reason that the Spirits of the Blood are greatly depressed, and in the mean time its sulphurous and saline particles are carried forth to the extremity, and from thence the *Crisis* of the sanguineous Mass being by degrees changed, it degenerates into an evil disposition. And indeed, the sulphureous part of which being exalted by it self induces a notable rancour to the Blood; and there is wont to be excited, sometimes continual, but often intermitting fevers so familiar, by the unwholsome air, for the reasons elsewhere shewed. If from such an occasion (as it very often happens) the saline principle is carried forth together with the Sulphur, such a scorbutick disposition as we have above described, like to fretted or ropy Wine is impressed on the Blood. Not only a great tract of humid and vapourous Air, is unwholsome after this manner, but also to dwell in houses situate near any marish, or encompassed about with a pond or moat, or in houses new plastered with lime, renders persons obnoxious to this Disease.

Why it follows
upon long fe-
vers.

2. A Fever of long continuance, very often induces the Scurvy: the reason of which manifestly appears from our *hypothesis*; for from the often, and too much deflagration, of the Blood the Spirits are very much wasted, and like liquor that becomes poor and liveless; by its burning, a great plenty of the more pure Sulphur evaporates, and in the mean time what is left of it, associating to it self the Salt, carrying it up, is wont to cause the *Crisis* of the Blood to become plainly morbid and scorbutick. It is to be observed, after a long Fever, by reason of the Spirit and Sulphurs to much exhaling and very much of the Salt being for a long time concocted with the remaining Sulphurs, that the Blood becomes very salt, and as it were lixivial, so indeed that from thence, it is scarcely enough inkindled in the heart to perform the circulation: such a disposition of the Blood is not to be restored, but by a long time, and is very difficultly hindred from running into the Scurvy. Not only after fevers, but also after other chronical diseases, evilly cured, the Scurvy is induced, and that for a double reason or means of affecting, to wit, either because the Blood is changed by the present disease towards a scorbutick disposition, or because the disease hinders the sick for a great while, from any exercise, or motion, and from thence they are inclined, by a long Idleness and sitting still, to the Scurvy. The first is discerned in Melancholy, when by the depression of the Spirit, and the Salt being carried out into a *fluor*, the Blood turns to a Sourness. This kind of *Crisis*, the Sulphur afterwards associating with the Salt, and both of them being carried forth, easily passes into the Scurvy. The Hypochondriack Affection is so much of kin to the Scurvy, that it very often takes it for a Companion: for the melancholy feculencies, which only after the nature of that affect pollutes the Blood, afterwards perverts its *Crisis*, and renders it scorbutick: in like manner the Jaundice and Dropsie which at first only infects the Blood by an impure and incongruous Mixture, after a long stay, quite changes its Temperament. 2. Many other Diseases accidentally induce the Scurvy for as much as the sick are hindred from any kind of Labour or Exercise; so that their blood is very little eventilated, but retained, like Wine a long time upon its lees, looses its *Crisis* or Temperament, and is liable to the inordinations of the Salt, and Sulphur. After this manner the Palsie, Lumbago, or feebleness of the Loins, the fracture of Bones, Ulcers, Wounds long time in curing, render Men obnoxious to the Scurvy.

3. The

3. The Scurvy is sometimes contracted by succession, so as the contagion of the Disease being derived to Children from their Parents, without any other external or internal causes, produces infected fruits exactly like the nature of the scorbutick Affection: So have I known Children sprung from sickly Parents, to have been affected with wandering pains in their Limbs, an eruption of Spots, an erosion and rottenness of the Gums and Teeth. Besides it is observed, the Children of Parents touched with the venereal Disease, to be obnoxious to most grievous symptoms, like to the scorbutick Affection. The reason of these sorts of affections seems to consist in this, for that the filthy taint being impressed on the genital humour, becomes like empoisoned ferment, which although it for a long time lies hid, being involved with other Particles, at last exerts its power and raises up the symbolick Elements of Sulphur and Salt in the Blood or nervous Juice, and by carrying them above the rest of the Particles, inclines to the scorbutick taint.

3. How it is contracted by Succession.

4. By the same reason and means of affecting, the Scurvy is propagated by contagion, viz. the Effluvia's proceeding from an infected Body, and entering into the Pores of one that is near or inspired by the Breath, ferment either the Blood or the nervous Juice, or both of them together: and so by carrying up the spirituous-saline, and sulphureous Particles, pervert the Temperament or *Crisis* of the Liquor, according to their nature.

How by Contagion.

5. The causes of the Scurvy hitherto cited, respect more immediately the bloody Mass, and shew the disease to begin from its *latex*, without any great fault in the first passages. But lest we should think this Region, to which some attribute all the fault; to be wholly free; it seems to be determined according to the judgment of others, that the rudiments of the Scurvy is also sometimes conceived within the *Viscera* of Concoction, and from thence traduced into the Blood: For when it happens from the Chyle, being for a long time vitiated, that the nutritious Juice becomes incongruous, and is stuffed with Particles of enormous Salts and Sulphurs, which it carries to the bloody Mass; there is a necessity that its *Crisis* will at length be changed, and perverted according to the nature of the matter, by which it is constantly and daily supplied. Wherefore it is observed, that those who eat much of salt or smoke-dried Meats, and drink much Wine and strong Waters, by which means Salt and sulphureous Particles are violently carried into the Blood, are found to be very much obnoxious to the Scurvy: Besides those who feed much on Swines flesh or Fish, although fresh, but especially on Shell-fish, for that these Aliments have in them plenty of rank Sulphur and Salt (as may be gathered by the extreme stink of their putrefaction) are very apt to fall into the Scurvy, and which is more, sometimes into the Leprosie. On the contrary, they are not so incident to this Disease, who eat milk meats, raw and unripe fruits, fresh Cheese and other absurd things, which heap up in the Ventricle a great quantity of Phlegm; neither is the Juice nourishing the Scurvy, produced from depraved or ill digested meats; but sometimes Aliments fit or convenient enough turn into a morbid matter by the fault of the *Viscera*; which indeed happens not always by the fault of the Liver or Spleen, as some have thought, for these have no business with the Chyle; but the Stomach it self being endued with an extraneous ferment, perverts every thing that is put into it, and changes it sometimes into a sour, sometimes into a Salt or vitriolick pulp, and it is very likely also that the incongruous Juice from the Pancrease, or the cholidical passage, may be mixed with the Chyle, and imbue it with an heterogeneous tincture. We do not deny but that the Spleen and the Liver do not seldom contribute to the production of the Scurvy, but yet not the Chyle but more immediately the Blood suffers for their faults when the Liver is obstructed; so that the adust recrements of the Blood are but little or small separated, by reason that its Mass being more feculent, becomes too luxuriant with the particles of Salt and Sulphur concocted together. As to what relates to the Spleen, it is not altogether undeservedly, that so many complaints are exhibited against it, as to the production of the Scurvy: For as the office of this Bowel (as we have before shewn) consists in this, that it doth receive and separate both the atrabiliary or melancholy feculencies of the Blood, which consist in a fixed Salt and Earth, and also that it digests the same by a further concoction into a ferment, to be mingled again with the Blood: If then at any time the Spleen does not rightly perform these its Offices, the mass of Blood is wont to be infected in a double respect: to wit, either because the atrabiliary or melancholy feculencies are not wholly received by the Spleen being

How the Viscera and the first ways are in fault.

obstructed or debilitated; or because being received, the same are perverted into an unfitting and corruptive ferment of the Blood: After this manner and some times after that, the sanguinous Mass becomes evilly disposed, and not rarely by this only occasion, or by the accession of other causes, degenerates into a scorbutick disposition: And indeed from such a foregoing cause, we have formerly declared the hypocondriack affection to arise, to which truly the Scurvy (as even now we hinted) is so near a kin, that it most often is a companion with it, or follows hard after it. But it plainly appears by the observation before cited, that the Scurvy does not always and only arise from the fault of the Spleen: For some time past there was a noble Gentleman, who for many years had laboured under a scorbutick affection, accompanied with very many and grievously horrid Symptoms; The Physicians whilst they had this Gentleman in cure, concluded his sickness to be contracted by the fault of the Spleen; and all those heavy evils to come upon him for the sake of that Bowel: At last after being afflicted almost with continual pains, for the space of ten years, and also with the *Paralysis* and miserable Convulsions, wasting away, he died with a Consumption. The Corps being opened it appeared to the sense, that the Spleen so evilly defamed was free from all fault; for this inward was very laudable in figure, magnitude, substance, and colour, and without any tumor or obstruction: Besides the sanguiferous Vessels being opened and freed from their stuffings, the nervous Fibres appear'd firm enough, and the Blood contained within the pores of the Spleen, free from corruption.

wherefore sadness
and immoderate
studies beget the
Scurvy.

Among the causes of the Scurvy, that are wont to be derived from the inordination of the *non-naturals*, we may here deservedly place sadness, for it is every where observed, that men through some occasion struck with sorrow, and so remaining for a long time sad, do become scorbutick. The reason of which seems to be this, great sadness immediately affecting the inferior or bodily Soul, compels inwardly both its parts, to wit, the sensitive and the vital, straitens their *Systases* or constitutions, inhibiting their wonted expansions, and draws them into a lesser space. Hence the Animal Spirits being hindered from their due expansion, remit their Oeconomy, wherefore the Blood repeating its Circuits in a lesser compass, is apt to be heaped up about the bosom of the heart, and there to stagnate for this reason, when the Spirits of either Government, *viz.* either animal or vital are depressed, and the Blood and nervous Juice begin to be altered in their complexions, either of them by degrees losing their vigor, turns from a generous Liquor to one four and lifeless: Besides the *Viscera* of Concoction being denyed the wonted influx of Spirits, perform very untowardly their Offices. Hence from the Chyle not rightly concocted, or being depraved in its coction, the nutritious Juice being stuffed with feculencies, becomes vitious; and is poured on the bloody Mass, whereby it more perverts its *Crisis*, and causes it easily to pass into a scorbutick disposition. Moreover for this reason, immoderate and too serious studies, and the continual intention of the mind, for as much as from hence the Spirits being depressed, and the offices of the *Viscera* subverted, the chief *Crisis* of the humours altered for the worse, they often acquire a scorbutick taint: To which we may add, that both sad and studious persons, for the most part lead a solitary life; for which cause, both the Blood and nervous Juice, as water wanting motion contracts mud, is wont to be vitiated and ready to fall into a scorbutick corruption.

The scorbutick
taint is derived
from the Blood
to the Brain and
nervous stock.

These are, if not all the procatartick or more remote causes of the Scurvy, yet at least the chief of them which affix its taint on the Blood; there will not need any other *Ætiology*, to shew how it is derived from the hurtful Blood into the nervous Juice, for the Blood by its accustomed rite and law of circulation, distils a portion of its spirituous Liquor into the Brain: But as we have before shewn, from the Blood depauperated a thin *latex*, and from that a sharp liquor and salt withal, is drawn off after the manner of salts when they are distilled: Also besides from the feculent Blood, and as it were, muddy heterogeneous Particles, infesting the animal Kingdom, are brought forth; which notwithstanding are not easily admitted into a firm and sound Brain. Wherefore as such Particles being received within the *Encephalon*, do induce thereupon paralytick affections or Cramps; some causes precede, by which the constitution of the Brain is debilitated, of which sort they use to be, 1. Its evil hereditary Disposition. 2. Frequent Surfeits or eating too much, immoderate drinking of Wine, noon Sleeps, great Hemorrhagies, and other occasions, whereby either the animal Spirits are too much consumed, or the pores

pores and passages of the Brain, relaxed, and too much opened, that they admit of every thing brought from without.

CHAP. III.

Of the differences of the Scurvy, also of the Signs, Symptoms, and Causes of this Disease, and chiefly of those which arise by reason of the taint being impressed on the Blood.

FROM the causes of the Scurvy hitherto described, it will be easie to assign the differences of this Disease: For in the first place, this affection may be distinguished according to the twofold Region of the conjunct Cause, *viz.* the Blood and the nervous Liquor, for that it is either of this or that Kingdom chiefly, and is more deeply rooted now in the Blood, now in the nervous Juice. Secondly, according to the double taint of the Blood affected, to wit, as that shall be either sulphureous-saline, or saline-sulphureous, it shall also signifie the Scurvy by divers Names, or it shall be called according to the vulgar appellations, either bilous or hotter, shewing it self in spots or wheelks, and other more apparent symptoms; or Melancholy, whose poyson lying hid, as it were covered with ashes; is known rather by the intrinsic hurt of the faculties, than by outward eruptions. Thirdly, according to the Original and manner of invasion of the Disease, to wit, for as much as it is received either by contagion, or that it arises through an internal *procataraxis* or remote cause; also according to its various state, it is many ways distinguished, and is either beginning, more perfect, or desperate, and requires divers manner of Indications as to the Cure, of which we shall treat more largely hereafter. In the mean time, it is our business to recite the signs and symptoms of the Scurvy, and to add the causes of them, and after what manner they happen.

The differences of the Scurvy.

The Signs by which Prognosticks or *Indicia* of the Scurvy are taken, are either extrinick, to wit, certain accidents and circumstances, which till the more certain notes of the Disease appear, give a suspicion of it: So we may deservedly think, any one having a very lickly disposition, to have contracted some taint of the Scurvy, if he be sprung from scorbutick Parents, or if he have long conversed with a Wife, or Companions affected with it; or if he live near the Sea Coast or marshy or otherways unwholesom places, or if he should have had before a long Fever or other Chronical Diseases, or if he shall be sensible of help by anti-scorbutick Remedies, and that such ill disposition be without a Fever, or certain signs of any other Disease. Or Secondly, the signs of this Disease are present affects and symptoms, to wit, inherent to the sick body; which sort as they are manifold, are wont to be variously distributed, and reduced into certain Classes; that is to say, for as much as they are proper to the Scurvy, or common to it with other diseases, also for that they are excited, either about the beginning or in the increase of the Disease, or in its worst state or condition. Further, they are distinguished according as they shall be excited in the various parts of the Body internal or external, also for as much as they may happen either in the Head, Breast, the *Abdomen*, or about the Members or habit of the Body: By this way we have already recounted the scorbutical symptoms. But they may be aptly enough distributed according as they arise, either by reason of their taint, being fixed chiefly in the Blood, or by reason of the faults of the nervous Juice, or by reason of the congression, or as it were conjunct influences of either humour becoming enormous. We shall as much as we can, insist on this method, in reciting and unfolding the signs and symptoms of the Scurvy, although in the mean time, very many affections which seem to proceed from the singular fault of this or that humour, procure some fault of the other humour, to be also a part of the cause: As to what relates to the præternatural affections of the

Signs and Symptoms.

first passages, and the *Viscera* in the Scurvy, although they sometimes proceed from errors in living, yet most often the sicknesses of these parts becoming indeed permanent arise by reason of the Blood or nervous Juice, as shall be declared hereafter in its proper place. In the mean time, we will shew at once how the chief symptoms of the Scurvy proceed from the fault of this or that humour, or conjunctly from both.

1. What kind of Affections arise by reason of the scorbutick Dyscrasie of the Blood.

1. When as the Blood is very much infected with a scorbutick taint, evil symptoms follow for three chief Reasons, viz. 1. Because its Liquor being depauperated, wants its wonted vigor; so that it can neither be inkindled in the heart freely, nor be circulated lively and equally: For which Reason, a dejection, and as it were a falling down of the whole Soul, Sadness, Anxiety, difficultness of Breathing, a straitness of the Breast, intermitting Pulse, frequent Swoonings, and inordinate effusions of Heat and Cold follow. 2. The Blood abounding with feculencies, pours all about its Recrements on the parts which it walshes: Wherefore Spots outwardly, Pimples, Wheelks, Pustles, and Ulcers are excited. Hence also, Catarrhs, the Dropsie, a swelling of the Members, Ulcers of the Gums, Vomitings, Lasks, Fluxes, great Spitting, Sweats, a lixivial Urine, or filled with Contents, as also tumors of the *Viscera*, or obstructions do not seldom follow. 3. A poor and feculent Blood supplies the Brain and nervous stock with but a vicious Liquor; and so by the means of those Parts it communicates its faults: Besides, a depraved Blood does not afford presently a *Copula* or joyniting to the Spirits, every where abounding within the Fibres, convenient enough explosive for the acts of the locomotive faculty, from whence a spontaneous lassitude, or weariness, and impotency to the moving of the parts proceed.

2. How impressed on the Brain and nervous Juice by reason of the taint.

2. In the Scurvy, the moistning juice of the Brain and nervous stock, after it is infected with the filthy taint, offends in a treble respect. 1. For as much as it declines from a noble and spirituous, into a poor and thin Juice, from whence a languor and enervation of the whole Body, and in some part also an Atrophy proceeds. 2. For as much as this Liquor is changed from a spirituous-saline, into a sour, acetous Juice, from whence melancholy and fear, a failing of Spirits, and a suppression from their wonted vigor, and also almost continual griefs and irritations of the nervots parts, and a crackling of the Bones are induced. 3. For that this Liquor is stuffed with heterogeneous Particles, and infecting the animal Regimin, Convulsions, Spasms, or Cramps, Palsies, Vertigo's, soporiferous Affections, or pertinacious Watchings, at last Foolishness, or Moping, or Madness arise.

3. How by reason of the conjunction of either humour.

3. In a more heavy and inveterate Scurvy, the recrements of the Blood and nervous juice, being deposited together in divers parts, for as much as they are endued with saline Particles, which are of a divers nature, they encounter one with another; and by a mutual striving and effervescency, produce most horrible Symptoms. From hence arise intolerable dolors, chiefly at night, wandring pains in the Joynts, Rheumatismus, and other affections of this kind. After this manner, from the double fountain of the scorbutick taint, very many Rivulets of evil affections running every where in all parts of the whole Body, create griefs.

4. That yet a more full knowledge may appear, it will not be from the matter, to recount each of the aforesaid Symptoms, and the reasons of every one of them, and how they come to pass particularly to deliver.

The cause of the Symptoms unfolded.

Spontaneous weariness.

1. The first sign of the Scurvy, by which oftentimes a suspicion of the beginning of this Disease is given, is a spontaneous weariness, to which are added impotencies as to motion, also a debility of the Thighs, and as it were a sense of weight or heaviness. These Symptoms are wont to arise about the beginning of this Disease, and are derived rather from the fault of the Blood, than of the nervous Liquor, which is as yet scarcely infected: But this may be done in a double respect, viz. in the first place, for as much as the Blood being made impure, flings out serous feculencies in its circulation, and insinuates them into the pores and passages of the Muscles, wherewith they are stuffed and loaden, so that the Spirits being hindered and intercepted, they perform not freely enough nor lively their locomotive explosions: Besides, the parts being loaded as it were with a certain Burthen, they are not easily and readily moved as formerly. 2. From a vicious Blood, the explosive *Copula* of the animal Spirit becomes degenerate and weak, wherefore they neither readily accomplish, or nimbly perform the local motions: We believe in an inveterate Scurvy the impotency as to motion to arise also from depravation of the nervous juice; and from the want of Spirits.

2. Difficult

2. Difficult breathing and a shortness of breath upon any motion, is a familiar symptom of the Scurvy, of which as there are wont to be two causes, it depends now upon one now upon the other, and sometimes on both together. The scorbutick *Dyspnœa* or shortness of breath, if it be very frequent and almost constant, comes from the very poor, and as it were, lifeless state of the Blood, whereby it is indeed apt to stagnate, and not to be easily inkindled in the Heart: wherefore from any motion, as the Muscles urge the sanguiferous Vessels, by compressing every where their contained liquor, the Blood rushes somewhat more plentifully into the bosom of the heart, which when it is not there presently inkindled, and carried forth of doors, it lies heavy at the heart, and threatens a decay of the vital function: Therefore the Lungs that they may bring help, are moved more swiftly, that the Blood may be drawn forth quickly, and so for this end, to wit, the circulation of the lifeless Blood, and of it self almost immoveable, the often and short breathing is caused. In this case, with laborious breathing there is also a quick and small Pulse. 2. Sometimes the scorbutick *Dyspnœa* or short breathing proceeds from the fault of the nervous stock, for after the morbid or filthy taint has occupied the Brain and its appendices, the heterogeneous Particles sent from the *Encephalon*, as they are of kin to other nerves; so also to other Spirits, to wit, those serving to the motion of the *Diaphragma* and the Muscles of the Breast, come to the Brain; and so according as those Nerves are either inhibited or perverted from performing rightly their offices, a difficult respiration is produced of a various kind, and is for the most part either Paralytick or Convulsive: For the morbid Particles entering into the nervous stock, and about their foldings or extremities being more plentifully heaped up; are fixed with plenty of Spirits. Hence it sometimes happens from such a cohesion of Particles, (if perhaps they be Narcotick) that the Spirits inhabiting those Nerves, are every where bound and hindered from their designed actions: Whence respiration being hindered, other Spirits the guests of Nerves yet free, that they may perform the common task by their own strength, are very much stirred up, and so as much as they may, they cause a more frequent and laborious respiration. But whenever the Spirits flowing within certain Nerves, for the office of respiration, are affected with an heterogeneous, explosive, or spasmodick *Copula* or joyning of the ends of the Muscles, for the sake of whose pressing out, when they are excited through plenitude or for other occasions, they run into convulsive motions: And from thence the Lungs are detained with laborious and often repeated turns, now of *Systoles* now of *Diastoles*, like to asthmatick Paroxysms. In these cases, sometimes the Nerves of the *Diaphragma*, sometimes the Pneumonick, and those absolving the motion of the Breast, also sometimes perhaps those embracing the *Bronchia*, sometimes these, sometimes those apart from the rest, are stupefied or obnoxious to cramplike affections, and for that reason the various differences and ways of the anomal or unequal respiration occur: Some kinds and examples of which we may add hereafter. I know some ascribe the causes of the aforesaid Symptoms to the Vapours elevated from the Ventricle and its Neighbourhood, whose opinion in another place we have deservedly rejected, with reasons shewn to the contrary. *Eugalenus*, *Horskins*, and *Sennertus*, whom others follow, deduce the cause of the scorbutick *Dyspnœa* or purfiness, from the *Viscera* of the lower belly, being inflated or tumefied, and by that means pressing the Cawl, as it uses to come to pass in Hydripicks, and women big with Child. But I cannot assent to this opinion, because this symptom does not seldom happen to those, whose Belly and *Hypochondria* are soft enough, and who have the sinking below the Ribs, and the space for the motion of the *Diaphragma*, free enough, as I have often found upon examination. But, that difficult respiration fails upon Hypochondriacks, and sometimes also upon Scorbuticks, upon the perturbation of the Spleen, the reason is, because the splenick Nerves communicate with the pneumonick: Therefore indeed when either of them are beset with the morbid, *viz.* the spasmodick matter, and the same being moved in either of them, stirring up Cramps; it draws the others into a consent of affection, as I have already manifestly declared, discoursing of the hypochondriack passions: In all difficult respiration excited by reason of the fault of the nervous stock, the Pulse though for the most part strong enough, yet becomes quicker than it ought to be, and sometimes intermitting.

A straitness of the Breast heavily infects some scorbutick persons, which kind of symptom hath joyned with it a difficult respiration, and commonly is ascribed to the

A straitness of the Breast.
the

the same Cause, to wit, from the compression of the Caul by the elevated *Viscera*. But yet though the Breast be sometimes by that means straitned, that those purely affected can hardly draw their breath, but that the taking in of the breath terminates in the midst of the *Thorax*, yet sometimes on the contrary, they draw in the Breath too deeply, so that they breath it out again hardly and difficultly; which certainly by no means ought to be attributed to the inequalities of the inferior *Viscera* in the *Diaphragma*; but either to the undue accension of the Blood in the Heart, or rather to the preternatural affection of the Nerves, serving for respiration: By the like reason also the cause of more difficult inspiration or taking in the Breath, is deduced from the same fountain, viz. in either case the Nerves serving for the drawing in and thrusting out the Breath, for that they are possessed with a morbidick matter, and that either Narcotick or Spasmodick, they perform in the executing their proper Offices either more or less than they need to do. But sometimes scorbutick Persons are troubled with a straitness of Breast, without the breathing much hindered; so that they feel the compass of the *Thorax* to be more strictly drawn together, and to be contracted into a narrower space: In the mean time, those so affected complain rather of the anxiety of the heart, than of any hindrance of the motion of the Lungs: The cause of this seems to be, that the Membranes investing the *Præcordia*, for as much as being too much irrigated with a serous humour, together with the nervous, become more contracted like wet Leather: So that their Fibres being irritated, wrinkle themselves too much into short Convulsions or Spasms, and from thence they force the containing parts to be straitned: Besides, this kind of straitning of the *Præcordia* follows in some part the motion of the Heart it self: For whilst the Blood is made poorer, it does not leap forth strongly enough from the bosom of the Heart, nor flames out openly into the Lungs. Wherefore these need the less to be dilated or expanded, but rather that they may answer to the circulation of the Blood, performed in a lesser compass, and exactly quadrate to the investing Membranes, and to the nervous Fibres destinated to their motion, they are regulated according to the weak limits of expansions: Wherefore this constriction of the *Præcordia*, as I have observed in very many, is wont to be suddenly remitted and intended, by reason of the occasions of Joy and Sadness, even as the Blood leaps out more plentifully or more sparingly from the bosom of the Heart, the greater or the lesser space is proportionated to its Circulation.

Inordinate
Pulse.

4. An unequal and an intermitting Pulse, also frequent swoonings and fear of the same, very often happen in the more grievous Scurvy, the same reason of which as of unequal breathing, is ascribed deservedly, now to the undue accension of the blood in the Heart, and now to the inordination of the nervous stock. The Blood being made more saltish, and besides much stuffed with scorbutick feculencies, is but unequally and brokenly inkindled, like the oyl of a Lamp imbued with Salt and muddy filths: Wherefore from hence an irregular Pulse, with a wasting of the vital spirits in the Brain is stirred up. Moreover, when the cardiack Nerves are also beset round with a morbidick matter, so that the influx of the animal Spirits, by which the motion of the heart is continued, is not performed in a just dimension and equal manner, by that means it happens that the motion of the heart is somewhat hindered, and its reciprocations variously disturbed; an unequal or intermitting Pulse, and a small and weak seems to proceed from the dyscrasie of the Blood, but if it be great and strong enough, from the fault of the animal function.

The passions of
the Heart.

5. The trembling palpitation and great leapings of the heart often happen to those scorbutically affected; these sort of passions are merely convulsive, and altogether depend on the cardiack Nerves, to wit, belonging to the heart it self or *Pæricardium*, beset with a spasmodick and explosive matter: For the animal Spirits, the inmates of the Nerves themselves and of the Fibres, and their appendices being inordinately explosive, compel the whole joynting of the heart to be cruelly shaken and moved. In the mean time, whilst the whole bulk of the heart is agitated by that means, it does often rightly perform the proper motions of *Systole* and *Diastole*, as I have observed in many, who with such a shaking of the heart have had an ordinary and laudable Pulse.

Erratick Fe-
vers.

6. Erratick Fevers, also sudden suffusions of heat and cold in several parts of the Body, use to come upon an inveterate Scurvy: The reason of the former is, because the extraneous matter being often carried to the Blood with the nutritious Juice, for that also the alible Juice it self is made degenerous, because it is not rightly mixed

mixed with the Blood, they stir up its extemporany effervescencies. In the mean time, a Fever observing a regular type, for that cause excited rarely happens to Scorbuticks, because the sanguiferous Blood, although it be taken with a feverish burning, does not burn long nor much, at least not equally: As to the sudden suffusions of heat and cold, they indeed seem to be inferred somewhat by reason of the affection of the nervous stock; for that the Nerves and Branches and nervous succours, do diversly embrace and compass about the sanguiferous Vessels in most parts of the Body, perhaps for that use, that the course of the Blood might be urged and restrained, as it were with Goads and Bridles, according to the force of the passions, and other exigencies of Nature, it is very likely that when the œconomy of the animal Kingdom is perverted by the scorbutick taint, that most of the Nerves and Fibres and their Appendices, being stretched out here and there; do every where run into spasms or convulsive motions, and also by reason of their hurt, the irregularity of the Arteries and Veins are contracted: So that the Blood is compelled into these parts more than it ought, and is too much estranged from them, from whence these kind of inordinations of heat and cold proceed.

7. Plentiful Sweats chiefly at night, are wont to be very troublesome to some scorbuticks, the reason of which is, that as the nutritious Juice being daily brought into the mass of Blood, by reason of the dyscrasie or evil disposition of this, and the impurity and filth of that is not assimilated; but being rejected of the Blood is sent away under the form of Sweat. But that the nutritious Juice in the time of its assimilating, becoming degenerate; does not produce an intermitting Fever after its manner, the cause is the sanguiferous intemperature of the Blood, which therefore becomes less able for periodick deslagrations: this sort of immoderate sweating happens chiefly in the Scurvy, following upon a long Fever or other Chronical Dyscrasies, where the nutritious Liquor is perverted, rather by the default of the assimilating Blood, than of the concocting Viscera.

8. In a more certain Scurvy, as in other Diseases, we consult the Urinal: For if the Urine appears intently red, and as it were lixivial without a Fever or the Jaundice, we undoubtedly pronounce this a sign of that Disease: For whilst the serous Latex is circulated for some time with the soluted Salt and Sulphur, the saline and sulphureous Particles being inconcocted in the same, bestow on it a very deep and as it were lixivial tincture: Also that such Urine abounds very much with contents, which, the stale being cold, precipitate to the bottom, it altogether owes it to the Particles of the degenerate nutritious Juice, snatched away with the Serum. But yet the Urines of the scorbutick persons often vary, for sometimes they appear of a Citron colour, with a Cream swimming in it or fixed to the sides of the Glass, from whence an *indicium* is taken, that the Blood doth abound with saline rather than sulphureous Particles: Indeed if such an Urine be exhale at the fire, the saline residue will remain in almost the double quantity of the Liquor. Moreover, sometimes the Urines of the Sick are changed from this or that state to the contrary, so that what was to day red or of a Citron colour; to morrow is made limpid, clear, and thin, and in abundance: Which kind of Piss, as it appears, was not circulated long with the Blood (because it hath received no tincture from it) we judge to come to pass from the watry recrements of the Blood and nervous juice, contained partly within the Lymphæducts, and partly deposited within the Pores and passages of the solid parts, which when they are gathered together to a fulness, every where run forth of their Receptracles with the rising flood, and rushing into the bloody Mass, are from thence sent away presently by the Reins.

9. There follows upon this Disease being grown very grievous, a plentiful spitting, and for the most part a bloodiness of the Gums, and then a looseness of them and at length a putrefaction, which is wont to be accompanied with an Erosion, Looseness, or falling out of the Teeth, and with a stinking Breath: That the reason of which may the better appear, in the first place, you are to be advertised, that there are ordained about the peculiar parts of the mouth, certain Pipes or passages, to wit, salival, by which the serous humours are plentifully sent forth: These arising from various Glandula's, to wit, the *Parotides* being in the Wefand or Throat, the Maxillar for those belonging to the Jaws, and those under the Tongue for the most part terminate about the Gums or near them: The constant and ordinary Office of these, is to lay up the Spittle for some necessary uses in the Cavity of the mouth. Besides, it is observed, that the superfluous humours, yea the

Nightly Sweats.

Lixivial urine.

A plentiful spitting and ulcerous Affections of the Mouth.

more

more thick and vicious, are perhaps sent away forth adooors by this way, rather than separated from the Blood as by Urine, Sweat, and otherways. Quicksilver prepared with Salts and taken inwardly, or the Body anointed with it, is minutely dissolved by the saline Particles of our Body, and being with them involved, mixes it self most deeply: These kind of Concretions of Salts and Mercury, being diffused thorow all the humours, and into all the parts of the whole Body, as Nature endeavours to expel the trouble they afford; the best and indeed most easily performs their execution, by these emunctories of the Mouth: For the Blood, and perhaps in some part the nervous Liquor being burthened with those mercurial-saline Recrements, endeavour by every way to shake them off; which however, when they are more thick and fixed, than that they can be exhaled or distilled forth by sweat, or sent away, being precipitated by the ferment of the Reins through the Urine; they are sometimes breaking thorow the little mouths of the Arteries, inserted in the Intestines, in some part excluded by the Belly: But yet the particles of this Medicine being involved with the *Serum*, and most readily deposited in the aforesaid Glandula's, and in others belonging to the Mouth and Throat, flow out by salivation more plentifully excited; by which effluxion it happens that the Gums and other parts of the Mouth are ulcerated, and the Teeth are loosened with a stinking of the Mouth. But this kind of salivation sometimes succeeds of its own accord, instead of a *Crisis* without *Mercury*, in the declination of ill judged Fevers, and the humour to be excerned, sweating forth not only from the more open holes of the salival passages, but also from the little mouths of the Arteries every where thick planted, daub over the Cavity of the Mouth with a whitish scurf. The like reason as of these accidents, may be rendred of these sort of Symptoms in the Scurvy: For indeed when in a depraved Blood, more and thicker recrements of the enormous Salt and Sulphur are gathered together than can be excerned by evaporation or by Urine or Seige, they are carried to the emunctories of the Mouth; by which the more salt purgaments of the Blood are wont to go forth; these salt things being diluted with the *Serum*, sweating not only from the salival Vessels, create great spitting; but also being carried thorow the Arteries, enter into the soft and spongy flesh of the Gums, which first of all, their pores being filled with an ichorous Blood, swell up; but afterwards the salt Ichor going forth from the Blood, and being continually excreted, the flesh of the Gums, by reason of the defect of laudable nutriment, grows flaggy, leaving the Teeth almost naked. Further, by a long afflux of matter plainly corrosive, the flesh of the Gums is eaten away; so that the Teeth can hardly stand, but grow loose or fall out of the corrupted Stalls: And by reason of the saline-sulphureous Particles, partly of the excreted humour and partly of the putrefying Gums, being continually breathed forth, the filthy stinking smell of the mouth is excited.

*Various Spots
and Welks.*

10. Spots breaking forth in the Thighs and in other parts of the Body, are accounted a pathognomick sign of the Scurvy: These are sometimes about the bigness of a Penny, and often as big as a Shilling; sometimes the Skin seems to be marked or spotted an hands breadth or more in some part: Besides these Spots are of divers colours, to wit, now Citron Colour, now Dark, now Purple, and sometimes appear livid, blewish or black: Besides some have welks variously swelling, *viz.* now lightly, now with a hard, and as it were a crusty skin, or they break out with scales here and there in all the members of the Body: Among the spots and breakings forth whether tumid, or equal, or rough, this difference is noted in general, *viz.* that these contain a matter not congruous with the Blood, wherefore being secreted from its Mass in its circuit, they are fixed in the Skin; neither are they altogether forsaken by the Blood, but that the Blood passing by adds to them others and new Particles, whereby it comes to pass that the extravasated matter, by the continual approach of the Blood, is either at length supp'd back again, or being subtilised is breathed forth, (and sometimes it is effected partly one way and partly the other) or lastly that matter being ripened, runs into an Ulcer or Sore. Moreover, Welks almost of every kind do generally happen not only in the Scurvy, but in many other Diseases, yea if at any time the Blood does immoderately boyl up through any occasions. But spots are portions secreted from the Blood and every where forsaken by it; so that there is nothing of commerce between them and the circulated Blood, wherefore they increase not in bulk, nor suppurate, nor easily evaporate. The Citron or darkish Spots seem to be some portions of Choler or Melancholy,

melancholy poured forth from the Blood into the Skin: But as to the black or Purple marks, it is to be known, that they are not excited in any other diseases, besides pestilential Fevers, the venereal disease, and the Scurvy: In the Plague and malignant Fevers they seem to be certain rejected parts of the blasted and deadly affected Blood, to which always a malignity and Contagion are joyned, as we have else where shown more at large: In the Pox and Scurvy, though there is not so much malignity found, that the Spirits of the Blood are greatly mortified, or that its liquor becomes so greatly blasted, yet we may well suspect, that in either disease, growing grievous, the Blood being apt to be in some measure broken and coagulated, it grows together into lesser Clotters; which sort of Concretions of the Blood being extruded at the mouths of the Arteries, are fixed in the Skin, and according as these portions are greater or lesser, and participate more or less, of the corrupted Blood, the Spots also, as to their bigness, and colour, are fixed in the Skin.

11. A Flux and looseness of the Belly happens frequent enough in the Scurvy, so that the *Feces* of the Belly, which are sometimes liquid and sometimes compacted, and of divers Colours, seem to exceed in quantity the aliment that is taken in, which sort of Flux, although it appear immoderate if it be stayed by the use of Medicines, presently the Sick are wont to find a swelling of the Ventricle and *Hypochondria*, a hardness of Breath, or a wasting of the Spirits. The cause of the scorbutick *Diarrhœa*, is partly, that the Chyle is not rightly cook'd, neither is it soon enough, or sufficiently born through the milky Vessels; hence stagnating in the Intestines and becoming degenerate, is cast forth a doors, but this chiefly happens, for that the impurities admitted within, from the bloody Mass, drop out from the little mouths of the Arteries, wherefore the things excreted are more copious sometimes than those put in. *The Flux of the Belly.*

12. By the like reason, Scorbutick and Hypochondriack persons are found obnoxious to frequent Vomiting, nauseous Belching, and heart pains: which Symptoms indeed do frequently happen in this Disease, partly, because the Tone of the Stomach is loosned, and its Ferment vitiated, whereby it comes to pass, that the reliques of the Chyle evilly concocted, is turned into austere Salt, Vitriolick, or otherways degenerate pulp, and besides, though the Stomach be ill, because the recrements of the Blood restagnating within, are poured into its Bottom. *Vomiting, Nausea, flatulency, &c.*

13. Sometimes a dysenterick Affection, also frequent hæmorrhages or flowings of Blood at the Nose, the Fundament, Reins, *Thorax*, Gums and other places, follow those sick of an inveterate Scurvy: The cause of which Symptoms is, for that the Blood being made more salt, and therefore more apt to grow hot, easily breaks forth at the mouths of the Vessels; but chiefly, because when the tone of the solid parts is weakned, and that the Fibres are made very lax, the mouths of the Vessels become broader and discontinued, so that it does not rightly lead the passages from the extremities of the Arteries into the little mouths of the Veins, but that the Blood being intercepted between the openings of the Vessels, and being there apt to stagnate and flow out, by what it can, it easily breaks forth, and slides it self forth a doors. *Dysenteria and Hemorrhages.*

These are the chief Symptoms, which are wont to be inferred by the Scurvy, by reason of its taint; being impressed on the mass of Blood, and from thence translated immediately into other parts, some of which also happen to be caused, partly by the depravation of the nervous Liquor. Now we will next consider of the Effects and Accidents of this Disease, which are wont to be excited, almost only or chiefly by the fault of the nervous Juice.

C H A P. IV.

The Symptoms and Accidents which are wont to arise in the Scurvy, by reason of the Taint impressed on the Brain, and nervous Stock.

*Fearfulness and
Languor of the
whole Body.*

1. **W**E have already intimated, that in the more grievous Scurvy, the moistning Liquor of the Brain and nervous appendix is wont to become thinner and poorer, whereby it comes to pass that most of the animal Functions are performed untowardly and slowly, hence the locomotive power flags very much, so that the sick loving Idleness and ease, shun exercises and labors of the Body, go about unwillingly any Task, and presently being weary give it off. I have known in some the whole sensitive Soul to seem lessened, and as it were made unequal for the Body, so that the sick, believing themselves not able to walk, nor stand, have refused altogether to be raised, or to rise from their Beds; when as yet no evident cause did hinder, but that they were strong enough to do what was required: Besides such, however ingenious they were before, abhorred the Studies, and labours of the Mind, and plainly affected to wear out their Life by doing nothing.

Melancholy.

2. In an inveterate Scurvy the nervous Juice declines from a spirituous-saline disposition towards a sour one; hence, as we have elsewhere shown, Melancholy, a fluctuation of the mind, an often mutation, and inconstancy of purposes, proceed: moreover, as the nervous Fibres are perpetually watered by the influx of such an humor, from hence, in some part, come the more light Spasms or Twiches, cramp-like contractures, and wandering Pains. But indeed, the chiefest vice of the nervous liquor, is wont to be, that being stuffed with filth and sculencies, it contains heterogeneous particles, and divers ways hurtful to the animal regiment: wherefore happen very often to Scorbuticks horrid and grievous Affections, of which sort, are the following Symptoms.

*Scorbutick Pal-
sis.*

3. Paralytick Affections, viz. Impotency, or the resolution of one or more of the Members, also stupor, or lack of feeling, and a sense of tingling, or pricking, often follow upon a deep and heavy Scurvy: which sort of Symptoms are not however, for the most part, very much fixed and permanent, but sometimes they cease or remit, and anon are repeated or increased. The scorbutick Palsie is wont to be excited chiefly from three sorts of causes, which now conjunctly now divisively produce this Disease. 1. For the Debility, or resolution of the Members happens, because of the nervous Juice being departed, there wants a sufficient plenty, or stock, of the animal Spirits, whereby all the members should be actuated: Hence, the sick have the locomotive faculty flagging, or weak, as if infeebled by old age, about the thighs, and feet, and sometimes in other extreame parts, to which the influx of the Spirits doth not plentifully reach: perhaps afterwards, as greater afflux of the Spirits is carried to the affected Member, and is in the mean time else where deficient, the disease ceases, or is transferred to another place. 2. Sometimes the animal Spirits, although they are plentifully and sufficient enough, in the parts, yet they are infected with Heterogeneous, and as it were narcotick particles, brought along with the nervous Juice, so that being as it were bound, and almost overwhelmed, they are not able sufficiently and nimbly enough, to perform their explosive endeavours, or labors: hence arise not only the impotency of the motive faculty, but also a certain depravation of the sensitive, viz. a benumbedness, and a sense of stinging, tingling or pricking: for that, whilst the animal Spirits are loaded with an incongruous Copula, their irradiation, like the beams of the Sun, passing thorow a cloudy air, is performed, but refractedly, and disturbedly. 3. Although the animal Spirits are dispensed in a sufficient plenty, and are free and clear of any narcotick quality, yet oftentimes their passages are obstructed, so that the Commerce between the inflowing Spirits and those implanted within some members,

cannot

*From 3. sorts of
Causes.*

cannot be performed conveniently; for it sometimes happens, that the more thick and earthy Particles do enter into the bodies of the Nerves with the moistning Juice; which so stuff the passages, about the enfoldings of the Nerves and other nervous windings, with their full burthen, that the irradiation of the Spirits in this or that member is wholly hindered. So I have known some, who have had a hand or foot wholly enfeebled or resolved, whilst the arm, or thigh, with the rest of the Body was well.

4. From the like cause, viz. scorbutick Faculencies, fallen upon the Bodies of the Nerves, Grievs or Pains also, which are esteemed the most frequent Symptoms of this Disease, do in some sort proceed; But as they are of a divers kind, they also arise sometimes from other Causes. For indeed, the scorbutick Pains are either more light, uncertain, and quickly passing away, which depend sometimes upon a *Flatus*, or Wind distending the Membranes, and sometimes on a sharp or Salt matter, poured forth, now from the Blood, now from the nervous Juice, upon the nervous parts; which kind of matter, for that it is improporionate to the nervous Fibres, pulls or hawls them, and irritates them into corrugations or wrinklins and becomes painful: but, for as much as the same is quickly washed off by the flowing of the *Serum*, or dissipated by heat, the troublefom sense brought in from such a cause is more easily removed. Or in the second place, the scorbutick Dolors, are more grievous, very acute, and hard to be moved, which sort also, are either fixed, or determinated to some particular place, or wandring transfer the Pain, and that most grievous, from one place to another, as may be perceived in a wandring and Scorbutick Gout, and Rhenmatism, concerning which we shall discourse hereafter: In the mean time, fixed Pains and a long time remaining, are wont to be excited in divers parts, but chiefly in the Belly, Loyns Thighs, *Sternum* or Chest, and in the Head: It will be worth our labour, briefly to describe the Pathologie belonging to every one of these places.

Pains, of which there are several Species

1. The pain of the belly is so familiar to the Scurvy, that according to the German *Idiom*, it should take from thence its name. This Symptom, though in a lighter degree, almost continually afflicts some sick persons, to which is joyned now a looseness, and now a high binding up of the Belly: the reason of which seems to be, for that, when both the Blood and nervous Juice abound with impurities, both the Arteries and Nerves carry the plenty of excrementious matter towards the sink of the Belly, which being fixed about the Coats of the Mesentery, or the Intestines, stir up constant Pains, by a perpetual pulling the nervous Fibres. But besides there happen to some scorbutical persons, Paroxysms or fits of very acute Pains, as it were Colical Affections, which being protracted for many days, yea sometimes weeks, miserably torment the sick: so that they think their Bowels to be pulled, and torn to pieces with the grievousness of the Pain: these pains are wont hardly to be allaid with any remedies, unless with the more generous Opiates; and as soon as the virtue of the Hypnoticks is consumed, they are repeated with their wonted Cruelty, but continuing with a longer fit, very often torments in the Loins and Back are propagated and at length are diffused on the members of the whole Body: to this sort of affection a Palsie does not seldom succeed. But then in respect of the Cause of the Scorbutick Colick, it is not probable that it should arise from a sharp matter, deposited within the Cavities of the Intestines, neither from any simple humor, however mischievous it be impacted in their Coats: for this is quickly snaken off, or goes into an Ulcer, besides that is easily exterminated by the use of Clysters, or Purges: but indeed, these cruell torments of the Belly can come from no other cause, than the mutual strivings and effervescencies of the Salts (which are of a divers Nature) fighting or struggling together, whereby truly the Nervous Fibres are pulled; and as it were torn asunder. For we may suppose, that certain four recrements of the nervous Juice, like to vitriolick *Stagmas*, being gathered together about the foldings of the Mesenterie, or other nervous parts of that region, to which comes a serous *Colluvies* from the arterious Blood growing hot, abundantly stuffed with the particles of a fixed, and as it were a lixivial Salt, and with those swellings up produces as it were piercing Pains. From hence it may be argued that the mine of the former morbid Stock descends from the Head, by the passage of the Nerves, into the lower Belly, for that great headaches, also the Vertigo and Swimming, or turning round in the Head often preceed, and not rarely succeed this kind of Colick.

1. An almost continual Pain of the Belly.

2. Pains as it were of the Colick.

The cause of them.

Besides, it appears that from the Bloody Mass there is a large supply sent of particles of fixed Salt, passing as it were by *Deliquium*, or a straining thorow; because the fit of this Disease being very urgent, the Urine of the sick appears of a deep colour, and is very much stuffed with Salt, and is as it were lixivial, and oftentimes its superficies is variegated with divers Colours, like the train of a Peacock: But so soon as the Disease begins to decline, the Urine is better, and from hence they are wont to assume hope and signs of growing well. But that this affection of the Belly is often propagated into the Loins, the reason is because the nerves of the Loins and the mesentery intimately communicate, and in very many places are mutually inoculated: wherefore when the dolorifick matter superabounds in the passages of these, it easily passes into the neighbour processes of those: But then that the Disease increasing, the pains being diffused thorow the whole Body, almost every Joynt and Member are afflicted, the reason is, because when a more plentiful provision of the morbid seed is begotten in the head, than can be derived to the whole stock of the first affected Nerves, viz. the moving and intercostal pair; part of it entering into the Bodies of the other Nerves, and also spinal Marrow, spreads abroad this morbid mine, participating of acetous Salt into very many parts of the whole Body, which every where by the accession of the fixed Salt, from the bloody Mass becomes dolorifick: and lastly, after that the plenty of Spirits is profligated by the incongruous matter, the residue after the mutual effervescencies of the Humours, being in very many of the Nerves together beset, and mightily filled or stopped up, the waies of Emanation are obstructed, and their mutual commerce is broken off, so that 'tis no wonder if those long Pains end at last in a Palsie, not only in the middle of the Belly, where the morbid cause seems to subsist, about the foldings of the Mesenteric, but in other places round about, Pains not inferior to the Colick, are wont to arise. I know a noble Maid that was obnoxious to most cruel Torments, near the *Pubis*, during about the space of a Month, and were wont to be repeated upon any occasion, given without any suspicion of the Stone, or Ulcer in the urinary Passages: which kind of affection I judge to depend upon a morbid matter impacted in the nervous foldings, planted in the *Hypogastrium*. Further, it is familiar to scorbutical Persons, to find fits of very cruel Pains, sometimes in the right, sometimes in the left *Hypochondria*, and sometimes about the Region of the Ventricle: the causes of which we think to ly hid in the nervous foldings belonging to the *Viscera*, planted in that place.

Pains in several parts of the Abdomen.

2. Scorbutick Pains, are wont sometimes to infest the Loins, and also the Region of the Back, now above, now below, without any previous Affection of the *Abdomen*, or of the Reins. I have known several keeping their Beds with such a Distemper, perpetually crying out Day and Night, by reason of the intollerable torment: The cause of this kind of Passion may be ascribed to the acetous Recrements of the nervous Juice poured on the Membranes, and Tendons of those parts, and so stirred up into effervescency, by the accession of the Sanguinous saltiness.

In the Loins and Back.

3. By reason of the same conjoyning of Salts, affixed on the Membranes, Cloathing the *Præcordia*, very troublefom Pains about the region of the Breast, and not easily to be removed, are often induced; hence the Bastard pleurisie is so frequent a symptom of the Scurvy. I have known many scorbutical persons very much troubled for a long while, with a most grievous Pain under the *Sternum*, so that in several so affected, I could not but think there was some Ulcer, or abscess lying hid in the *Mediastinum*; when in truth this symptom did depend only upon the heterogeneous matter, brought thither, partly by the Nerves, and partly by the arteries, and there growing hot, being affixed to the Membranes; as the event often proved: for that the sick were freed, by the long use of antiscorbutick Remedies.

In the Breast and Pleura.

4. Hitherto we have recounted the chief kinds of Pains, infesting the middle parts of the Body. But in the Scurvy there is felt those no less troublefom, in the extreame parts, viz. the Head, Thighs and Leggs. As to the first, Headach is so rarely wanting to this Disease, that many by this effect are satisfied chiefly that it is the scorbutick Venom; by which they become obnoxious to most grievous fits of this evil, and handled for a long time, and oftentimes repeated. The cause of this is obvious to every one, that it may be ascribed to the humours poured on the *Meninges* or Films inwrapping the Brain, which also Anatomic hath proved.

In the Head.

For

For the Skulls of some of the dead being opened, I perceived both the membranes grown together, and every where set thick with little Whelks, and scirrhus tumors, which kind of tumors and concretions, seem to have risen from the mutual coagulations of the two-fold painful humour, after many effervescences.

5. Nor indeed is it any otherwise to be determined, as to the Pains most grievously afflicting the Thighs and Leggs of the sick, chiefly in the night time: for many labouring with an inveterate Scurvy as soon as ever they are warm in their beds are wont to endure intollerable torments, about the calves of the Leggs, Shins and Thighs, and sometimes about other parts, so that they cry out their flesh is gnawn, or torn in pieces like the biting of Dogs: These tortures if they leave their Bed, do somewhat abate; otherwise the afflicted are most miserably tormented all Night long: In this case there can nothing be more aptly conceived, than the acetous recrements of the nervous Juice, to fall down on the Leggs, as into a place having a great declivity and to be copiously affixed to their Membranes, to which whilst the rejected Salts do come from the Blood notably rarefied and agitated, thorough the heat of the Bed, and do ferment with these after the manner of Salts, therefore indeed from the mutual striving and effervescency of the Particles of divers kinds, the nervous Fibres being pulled and hawled beyond measure, run into painful Corrugations, neither do indeed these dolorifick Pains cease or remit, till the particles then gathered together, either evaporate or by their mutual wrestling being brought under are worn out, are quiet from their effervescencie; but then within a little space, fresh provision of either matter disposes to a new paroxysm, by reason of the mutual effervescencie and coalition. Of these kind of Salts of a diverse kind, proceeding from a twofold humour, the wandring Gout, the Rheumatism and certain other affections are produced, which we deservedly impute to the conjunct dyscrasies, and as it were evil confederations of the Blood and nervous Juice. Moreover in the same Class certain species of scorbutick Pains but now handled, ought to be placed; but because they are of kin to other Pain, arising from the Sole Vice of the nervous Juice, or of the Blood, therefore we have here joyned together the divers Theories of the dolorifick Affections.

As there is a conflux of Symptoms of a divers kind in the Scurvy, so there is begotten a manifold morbidick matter, and of a divers nature: viz. Heterogeneous particles coming into the Brain and nervous stock, with the moistning Juice, are sometimes narcotick, bringing forth the Palsie and sometimes saline, causing Pains, (as we have said) also sometimes they are nitro-sulphureous and explosive, from which the spasmodic or cramp-like affections arise: but by reason of particles of this sort go together in the Brain, there happen to scorbutical persons, Vertigos, swimings in the head and outrageous assaults, like the falling sickness: From the like cause, possessing the nervous Stock, proceed convulsive motions, tremblings, shakings, and very often horrid contractions in the Viscera and in the Members. We have already spoken largely enough of the nature, differences and causes of Convulsions. Besides we have fully described certain admirable cases of this affection, arising from the scorbutick infection, so that it seems needless to discourse any more of this matter, for it may be easily accommodated by the hypothesis before delivered, to all the spasmodick symptoms of the Scurvy whatsoever.

6. Those labouring with an inveterate Scurvy are very obnoxious to a Vertigo: *The Vertigo.* Concerning this affection, and also of many other Cephalical, we have made special disquisitions, which may perhaps be sometimes be made publick. In the mean time we will in one word signifie that this Symptom arises, for that the animal spirits are in some measure perverted from the wonted ways of their expansions, to wit, being either hindered on otherways driven from their series, state, and orders are compelled to break off: this happens to come to pass as in other cases, so chiefly in the Scurvie especially for two causes, either for the one, or the other, or for both together; viz. either because the commerce of the Spirits is obstructed somewhere, in some passages and Pores of the brain, being possessed by some extraneous guest, or secondly, some companies of the Spirits, being burthened with an heterogeneous *Copula*, or joynting are compelled to stay behind the rest, or to go out of their tracts: In this Disease the liquor indeed instilled to the brain from a very impure blood, brings with it very many Fæculencies, by which it can be no otherways, but that the heterogeneous particles should every where stuff up the

the Pores of the Brains and growing to the animal Spirits, oppose them or force them into explosions.

Sleepings.

7. Almost for the like cause, sleepiness and torpor, or heaviness frequently happens to Scorbutick persons, viz. for as much as the animal Spirits being burthened with watery or narcotick Particles, and very much oppressed, cannot perform readily their expeditious and quick motions within the Brain very much also abstracted, neither continue long the acts and exercises of their functions, but love to ly down and to indulge themselves with idleness and rest. Moreover, this sort of affection sometimes is stirred up by the defect and want of the animal Spirits; for from the Blood very much vitiated and as it were dead, the Brain and nervous Stock is supplied but with a thin Liquor, and almost lacking of all *Vigor*: From such a *Prophasis* or occasion, I have known a Lethargie excited in those about to dy, by which the affected though they seemed to indulge themselves with a continual sleep, yet being called are wont to know those standing about them, and to answer those who speak to them; but the store of the animal Spirits growing weary, they were neither able to wake long nor to attend to discourse. When I have opened such who were overwhelmed with perpetual sleep, I have found the Brain dry enough and altogether free from a Dropsie, or serous *Colluvies*, with which lethargick persons are wont for the most part to be affected.

And waking.

But sometimes on the contrary, some scorbutick persons are molested with almost continual waking. Which kind of Symptom proceeds sometimes from the affections of the mind, Grief, convulsive Passions, fear of Swooning, passions of the Heart, and also from the perturbations of the Stomach and of other *Viscera*; for as much as the Spirits being vehemently moved in every part of the sensitive Soul, their whole Hypostasis is detained from entering into rest, or a tranquil condition. For I have known some touched with a scorbutical Taint, who though they were free from Pains or Spasms, and also clear from any immoderate affection of the mind, have been induced to watchings day and night for many weeks, and oftentimes could get no sleep, though they had taken strong opiates: In the mean time they continued lively enough and ready to the performance of Labours; without any heaviness of the Head, and without any torpor or sluggishness of the mind or senses, as if they had wanted no sleep. The reason of this seems to be, that sometimes together with the nervous Juice, certain nitro-saline Particles of a fierce and unquiet nature, (of which sort are the effluvias falling from *Aqua fortis*, or the spirit of nitre) growing to the Spirits, compell them to be perpetually agitated and to be continually in motion: for even as Vapors breathing forth from stygian Waters, are never altogether fixed or at rest, so the heterogeneous Particles which are of that sort of Nature, adhering to the Spirits inhabiting the Brain, suffer them scarce ever to be idle or to indulge sleep. These are the chief symptoms that are wont to be stirred up in the animal regimen, by reason of the scorbutick taint being impressed on the moistning liquor of the Brain and Nerves; which with those before mentioned happen by fault of the Blood, degenerating from its right *Crafsis*. But as to those great and Herculian Diseases, to wit, the assaults of the Apoplexie and the Epilepie, which sometimes happen to scorbutical Persons: In these cases the former affection, being as it were married to another more worthy looses its name, and passes into the Pathology of that, as it were into its Progeny, lastly we will inquire what are the symptoms of the Scurvy by reason of the conjunct Dyscrasies of the Blood and nervous Juice, as it were joyning their alliances in Evil.

CHAP. V.

*Of the symptoms of the Scurvy which arise by reason of the
Conjunct Dyscrasies of the Blood and nervous Juice.*

IN this rank, in the first place is set the scorbutick Atrophy or consumption of the Flesh: for who labour long with this Disease often fall into a *Marasmus* without any signal fault of the Lungs, or suspicion of a Consumption or *Phthisis*, so that the Flesh wholly falls away, and the Skin becoming very flabby, scarce sticks on the Bones. The cause of which ought not only to be attributed to the fault of the Blood degenerating from its right *Crisis* or disposition; for this however depraved it be, for the most part assimilates some portion of the nutritious Juice, and bestows it on the parts to be nourished: but indeed when as the nervous Juice is also bad, the nutritive faculty is altogether inhibited; for that by the defect or fault of this, the nutriment elaborated by the Blood becomes altogether unprofitable and unfruitful: By what means, as to nutrition, either Liquor, to wit, the Sanguinous and nervous discharge themselves, we have else where shewn. From that hypothesis, which seems to be built upon sufficiently probable reasons, it easily follows that the Atrophie familiar to the Scurvy depends from the conjunct irregularities of either nutritive faculty. For as much as the Blood gives only vicious aliment, and that the nervous Liquor fails in the actuating and assimilating it, there is a necessity for the solid parts, being continually defrauded of their food, to wither away.

*The Scorbutick
Atrophy.*

2. The scorbutick Gout, which is very much wandring, and affects now this Part now that successively, now more parts together, and leaps about from one place to another, or from these places to those, seems to depend upon a double Stock, even as the Colick above described, but the manner altogether inverted. For indeed it is to be supposed in this Disease, that very many heaps of the fixed Salt, from the bloody Mass are disposed here and there about the Members and Joynts as so many Nests: which indeed being hid within so many distinct Cells, remain as the Eggs of Fishes, or as the feminine Seed, to which afterwards the acetous four recrements of the nervous Liquor come as the masculine Seed, and renders them fertile, to wit, in as much as the Salts of a divers nature, being commixed, they greatly ferment or grow hot; and so by the mutual wrestling and agitation of the particles, the Membranes and nervous Fibres being notably hauled, they are carried into dolorifick Corrugations. In truth, it from hence appears that the first mine of this disease as also of the common Gout, is to be placed in the bloody Mass, and to be actuated by the Recrements of the nervous Juice, because when the assaults of the Pains arise in various parts together, or successively, the Blood seems not to grow hot above the measure, nor its salaments passing by *Deliquium* at that time flow out more plentifully; for that neither the Pulse becomes quicker nor the Urine lixivial. But in an urgent fit, very often a foregoing Headach, an heaviness of the Head or Vertigo, inquietude of the Members and often a leaping of the Tendons, which sort of Symptoms often precede or accompany the assaults of pains, argue the four recrements of the nervous Juice to suffer a flux. To this appertains that the acid liquors being drunk up, provoke the gouty Paroxysms. In the Scurvy indeed either Mine is more plentifully begotten, the nests of the Gout are longer published, and the pains in these do spring sooner by far: besides from a very impure Blood, a saline or tartarous matter is heaped up not only in the Joynts of the Feet or Thighs, but almost every where about the membranes and the interspaces of the Muscles, to which also an acetous *Copula* or joynting being poured out in many places from the nervous Juice, it becomes fruitful of Pains; then for as much as either Mine consists in a matter less thick, and is gathered together in open places, it is either washed away in a little time by the *Serum* flowing to it, or it is dissipated by heat, or else being sucked again by the Blood, it is transferred to some other place.

*The wandring
Scorbutick Gout.*

3. The

3. The Rheumatism.

3. The Rheumatism, as it is described by modern Authors, often comes upon an inveterate Scurvy. Which sort of affection, exciting Pains almost in all parts of the Body, one after another, although it appears like to the wandering Gout, but now described, yet it differs from it both in respect of the pains, which in a Rheumatism quicker pass over, and oftner change their seat, and that with them are very often joyned a small Fever, and a tumour of the affected parts, and a *phlegm* or Inflammation; as also by reason of the conjunct Cause, which indeed being of Kin to that which brings forth the scorbutick Colick, is clean contrary to the cause of the wandering Gout: For it seems that in the first preparation of this Disease, an acetous Mine is deposited in very many places from the nervous Juice, as it were the female Seed; to which sort of Symbols left in divers places here and there, whilst that the blood growing hot, pours forth its plentifully rejected saline reliques, presently upon the wrestling and Congression of dissimilar Particles. Pains are caused moreover, because the recrements of the Blood being exposed in the middle of its Course, they something hinder its motion, therefore a tumour and Inflammation is brought upon the part affected then, because the Blood at last licks up again the Matter, but now rejected by itself, and transfers it to some other place, those often shiftings and mutations of Pains happen. This Affection deserves a peculiar consideration: but this may suffice to have said these few things of it in general, to wit, as it is a symptom of the Scurvy.

How the Diseases differ being excited by themselves, and brought on by the Scurvy.

Hitherto we have unfolded the Symptoms of the Scurvy, arising from a three-fold kind of Cause, the Pathologie of which contains in it self other manifold Affections, and very different in themselves: of which it is worthy to be observed, that as many Diseases, belonging to the Brain and nervous Stock, which exist very often alone and of themselves, come also upon the Scurvy; yet as to their formal reasons and as to the method, to be observed in the curing of these or those, a very great difference occurs. But when a Palsie, Vertigo, Convulsion, Lethargy, and other Diseases of that kind happen of themselves, they always depend upon a more fixed cause, and very much on some notable fault of the Head and nervous Appendix; and as Cephalick remedies and appropriate to those Diseases only, are convenient, yet the success does not easily nor always answer to their Wishes. In the mean time either little care is taken for the Emendation of the Blood, or if it be, for the most part it is, in vain: But when these affections are brought in by the Scurvy, there is less danger, and although they have oftner fits, yet they more easily pass away; but the cure of the Disease is performed more happily by Antiscorbutick Remedies than by Specificks and by reduction of the Blood to a due Crasis or Complexion, rather than by administering any thing to the evils of the Brain and nervous Stock. The same observation is to be had in Tumors, Ulcers, the Dropsie and many other Distempers brought in by the Scorbutick infection, which otherways when excited by themselves, are healed only with antiscorbutick Remedies. The reason of which is, that in the Scurvy, the conjunct cause of the Symptoms and of very many Affections, consists for the most part only in the humors, to wit, in the Blood and nervous Juice, and not in the solid parts, viz. the Viscera, Pericordia and Brain, wherefore when their Dyscrasies or evil dispositions may be more easily mended, then the evil formations of the other Diseases of this kind, are more certainly and easilier or with less trouble cured, when excited by reason of the Scurvy than when they come to themselves. But when the Disease is more deeply rooted, and that the principle solid parts are hurt, (as it many times happens) viz. when the recrements of the Blood and nervous Juice, being impacted for a long time in them hurt their Tone, stuff their Pores and Passages, and bring forth in them Scirrhus Tumours, very often, or Ulcers; the aforesaid Symptoms, although imputed only to the Scorbutick Taint, seldom or never admit of a Cure, and by reason of this invincible Cause, at last the Scurvy it self becomes desperate and deplorable.

CHAP. VI.

The Prognosticks of the Scurvy.

When in the scorbutick affection very many and sometimes very cruel and horrid symptoms together are wont to oppress, there is expected a *prognosis* from the Physician: Yea he himself, that he may the better institute the method of Curing, carefully weighs what may be the future event of the Disease: Notwithstanding Judgments in this case ought to be cautious, a long while suspended and not too rash, for very many (as have fallen under our observation) esteemed desperate, have grown well. I have known some whom a frequent and horrid *Asthma* had already seemed to have choaked, others continually dying with frequent swooning, and also others troubled either with the Palsie, or convulsive Paroxysms, or with a most grievous Colick, to be wholly freed in a short space by the help of Medicines. I have again known some scorbuticks swelled with the Dropsie through their whole Body, others reduced by an Atrophy to an extreme leanness, at last restored to perfect health. Therefore although those labouring with this Disease, are sometimes urged with affections highly dangerous, yet if the *Viscera* be still indifferently whole or at least not much vitiated, we ought not to despair of those evils; excited through the mere taint of the Scurvy. But on the contrary, when symptoms less terrible appear, if the Contents of the *Hypochondria* and *Abdomen* become hard and as it were schirrous, or if the Lungs begin to be corrupted; there is no great matter or benefit to be promised as to the cure of the Disease: But in cases not desperate, where a hope of recovering health is left, or at least the fear of sudden death is far off, if perchance the question be asked how soon or how long, how easily or difficultly the Cure may succeed, let the answer depend on these sorts of judgments.

*The Prognosis
in the Scurvy
ought not to be
without consi-
deration.*

1. The Scurvy as it does not strait kill those affected with it, or precipitate them into an incurable state, so neither is it soon or easily cured: For the chief cause of the Disease consisting in the dyscrasie of the Blood, is not easier to be taken away, than Wines to be restored to their due complexion when they are made fretted or ropy: Wherefore those corrupted with this taint, endure its hurt for many months, and sometimes years, yea sometimes through their whole life.

2. This Sickness depending on the sulphureous-saline intemperateness of the Blood, or like to the mere hot fretted Wine, is more hardly cured; than if the same proceeded from the saline-sulphureous dyscrasie, or less adust like to ropy wine: For this evil constitution of the Blood or Wine, may be after a sort brought again to the condition from whence it fell, but that is wont not easily to be reduced into the state which it departed from.

3. The Scurvy coming upon long Fevers and other Chronical Diseases, is cured, or coming upon an originally, or for some other occasions, sickly constitution, is esteemed of a more difficult cure, because indeed in these cases both the *Crafsis* of the Blood is more vitiated, and not seldom also some hurt is affixed to the *Viscera*. Next to these they are hardly cured, who by reason of an evil manner of living, and chiefly by the assiduous drinking of the more generous Liquors, have contracted this taint with hurting the tone of the Ventricle and other *Viscera*: But those who are become scorbuticks by reason of Contagion, the unhealthfulness of the Air, going to Sea, or a sedentary Life, are more often and with less trouble restored to health.

4. This Disease being yet fresh, so long as the taint being included only in the bloody Mass, is not yet impressed on the Brain and nervous stock, nor hath excited durable symptoms in the solid parts, often admits of a perfect Cure: But if the affection being more deeply rooted, is propagated into the animal Kingdom, and there produces spasmodick and dolorifick passions, and that its poyson hath spread itself more largely by the eruption of spots and breakings forth, and by the erosion or eating away of the Gums and Teeth, and by other pathognomick signs, it is

scarce ever wholly extirpated; but the chief business of Medicine is employed in giving help to the Symptoms most grievously urging, and in suppressing their increase and extremities.

5. Those who labour with an inveterate Scurvy, refuse to live moderately, but indulge their sickly appetite, readily desiring what is nought: And besides they are very morose and difficult to take Remedies, so that they very often delude the labour of the Physician, that in truth it is better to leave them to their evil *genius*, than to defame profitable Medicines prescribed in this case altogether in vain.

6. Because this affection growing grievous, the morbidick matter is manifold and of divers sorts, so that the cause of the Symptoms of a various kind and nature, is engendred; therefore Remedies not only of one kind are administred, but when a certain method of Medicine, though prescribed with the best judgment, profits little or nothing in the Cure, the sick are not presently to be left off, but other medicaments and then others are to be tryed: For indeed the same things are not convenient to all, nor always to the same person. In the sick Body the powers and combinations of Salts and Sulphurs every where vary, so also Medicines not helping should be as often changed, till something congruous and helpful be light upon.

7. If that notwithstanding or by the use of Remedies not rightly administred, the Scurvy by degrees growing grievous, is carried daily into a worse condition, at length it induces a Dropsie or Consumption, the next passage then is to Death, either from this or that Disease: For after that the Blood is very much depraved, it pours forth its recrements, being more plentifully heaped up either on the Lungs, or in the *Viscera* of the lower Belly; and so causes an affection of this or that kind equally mortal.

CHAP. VII.

Of the Cure of the Scurvy.

AS to what respects the Cure of the Scurvy, for that it is not one simple preternatural affection, but a whole Legion that is to be put to flight; therefore the method of Curing ought to comprehend manifold indications, and those variously complicated and subordinate, which after the ordinary mode may be referred to these three heads: to wit, that they be preservatory which respect and take away the cause of the Disease, and curatory which respect and take away the Disease it self and its symptoms; and lastly vital, which may defend or restore the power and strength of the Patient.

The Indication
three-fold.

1. *Preservative.*

At the very beginning of the Cure we ought to aim at the cause of the Disease, for this like the Root being cut off or pulled away, presently the Trunk, Branches, and Fruit wither: Therefore as we have shown the cause of the Scurvy to be founded in the dyscrasie of the Blood, *viz.* being either sulphureously-salt or saltishly-sulphureous; the first work must be that it may be mended and made better, both of this or of that sort or nature. To this end in the first place impediments are to be taken away, then the primary intention it self is to be performed; for either scope or purpose Remedies are required, from Diet, Chirurgery, and Medicine: As to Diet, there shall be shewn hereafter a special method of living, in the mean time we will proceed to the rest.

The Reduction of the Blood to its due *Crasis* by appropriate Remedies, is chiefly hindred by these two ways, *viz.* In the first place, because a provision of vitious nutritious Juice is continually inferred by it: Then Secondly, because the Recrements brought into its bosom are not sufficiently sent away through convenient sinks: Therefore care must be taken that the business of the Chyle may be rightly performed in the first passages, both that the vaporous Recrements may be sufficiently purged

ed

ed forth by Sweat, the serous by the Reins and Lymphæducts, the bilious by the gallish *Cystis*, the melancholy by the Spleen, and all the others of every kind by their proper emunctories; then these offices being rightly instituted we must endeavour to reduce by specifick Medicines, and chiefly those endued with a volatile Salt, the dyscrasie of the Blood: Remedies respecting every one of these intentions, ought to be used and administred together, but by what means and by what manner of administrations, shall be yet more particularly designed.

1. That the Chyle may be perfectly concocted in the first passages, care must be taken that the load of excrementitious matter heaped up in them may be exterminated, that the ferment being lost or depraved may be restored, that the passages and pores any ways stult and obstructed may be opened: To these ends, Cathartick, Digestive, and opening Medicines are destinated.

The Therapeutick Intentions.

2. The Excrements gathered together in the bloody Mass, when they are not sufficiently sent away by their proper emunctories, may be drawn forth by other convenient ways: For this purpose also Catharticks or Purgers, and besides Diaphoreticks and Diureticks, or Medicines that evacuate by Sweat and Urine, are convenient.

3. The scorbutick dyscrasie of the Blood should be mended by Phlebotomy and specifick Remedies: Wherefore that the whole business of the preservative indication may be reduced to one point, the Remedies which perform its chief intentions are Catharticks, Blood-letting, Digestives, opening Medicines, Diaphoreticks, Diureticks, and Anti-scorbuticks or Specificks. Then, for that indeed Digestive and opening Medicines are imbued, either of them with acid, biting, or saline Particles, they more often overcome; besides, for that Medicines of this sort move conveniently enough by Sweat or by Urine, therefore the Curatory provision requisite to the aforesaid intentions, may be yet reduced to straiter limits; to wit, that it may almost only consist in Cathartick, Digestive, and Anti-scorbutick Medicines, to which Phlebotomy may be added as occasion serves: It now is my part to design some forms and precripts of them, and also the manner of using them.

Purging:

Purging.

1. The method prescribed for the Curing almost of all scorbutical persons, begins with Purging Medicines; for unless the first passages are made clean, Medicines designed for any other use are infected by their filth: Wherefore Vomiting sometimes is no less convenient than Purging.

If the Ventricle (as it is often wont to be) is grieved with a viscid, souring, and unsavory matter, and endeavours to cast out the impure Load, by a nauseating and striving to vomit, and if the Patient is wont to bear such an evacuation strongly enough and with ease, there is no hindrance, so that their strength be not too much decayed, but that an emetick Medicine may be administred: For the more strong, let them take an infusion of *Crocus Metallorum* or *Mercurius Vita*, or the tartarous Emetick of *Mynsichtum*, or Glauber's Sulphur of Antimony: Those who are of a more thin and weak Constitution, let them take Wine of Squills, or the Gilla of *Theophrastus*: Let those who take but a small dose, drink after it good store of Posset drink, till the Ventricle being full to nauseousness, Vomiting may be the more easily provoked, by ones Finger or a Feather thrust down the Throat, which may be reiterated as often as they please. By this way of Vomiting the mere Contents of the Stomach being wiped from its foldings are sent forth; neither are there stirred up in any other of the *Viscera* about it, or in the Membranes (as it is wont to happen from Strybiates or Antimonial Emeticks) painful haulings or Convulsive, with swooning or fainting away. To those whose Ventricle, by reason of evil digestion, easily gathers together a load of Phlegm or other degenerate matter, I have prescribed (and often with good success) such a Vomiting once a Month, which they have found safe and wholesome.

By Vomit.

Where there is no need of Vomiting begin by a Purge, at least let there be some days between this and the other evacuation if this follows. I judge what in times past has been inculcated by Authors, concerning the preparation of the humours, to be either needless, or the circulation of the Blood not understood, to be alto-

By Stool.

gether erroneous: But in the place of that intention are substituted things restoring the Ferment of the *Viscera*, and things altering the *Crafs* of the Blood: In the mean time, that the filth of the first Passages and the recrementitious superfluities both of the Blood and also of the nervous Liquor may be sent forth, in the first place a light and gentle Purge is ordered and afterwards once a week it may be either oftner or seldomer repeated according to the strength of the Patient, and the strength of the Medicine may be proportionated according to the success of the first Dose. To this end Pills, Potions, Apozems, Electuaries, Pouders, and many other forms of Medicines are wont to be prescribed.

Remedies made known in a more hot Scurvy.

If the Constitution of the sick be more hot, and that the Scurvy seems to be founded in an adult Dyscrasie of the Blood, viz. a Sulphureous-Saline, all Aloetick, and Diagrydiat Purges are to be shunned, and only the more temperate made out of Senna, Rhubarb, and others which do not too much agitate the Blood and Humors, are to be administred.

Pills.

Take of the leaves of Senna $\mathfrak{z}\text{ij}$, of Rhubarb $\mathfrak{z}\text{vj}$, of Epithymum $\mathfrak{z}\text{ij}$, Roots of Polypodium of the Oak, of English or Monks Rhubarb dried, of each $\mathfrak{z}\beta$, of yellow Sanders $\mathfrak{z}\text{ij}$, of Celtick Spike $\mathfrak{z}\beta$, of the Salt of Wormwood $\mathfrak{z}\text{ij}$, being cut and bruised, let them be digested in a Glafs, in hot Sand, with white Wine and Fumitory Water, of each a Pint (or a Quart of our Magisterial antiscorbutick Water) for two days, the Colature being clear, let it be evaporated in the gentle heat of a Bath, to the consistence of Hony, then add to it of the Pouders of the leaves of Senna, and of Rhubarb, of each $\mathfrak{z}\text{j}$, of the Cream of Tartar $\mathfrak{z}\text{ij}\beta$, make a Mass for Pills. The Dose from $\mathfrak{z}\beta$ to $\mathfrak{z}\text{j}$.

Syrup.

Or prepare the same infusion, which being evaporated by a gentle heat, to the consistency of a Syrup, by adding at the end, of cleansed Manna and white Sugar, of each $\mathfrak{z}\text{ij}$, make a Syrup. The Dose from j to ij spoonfuls in a convenient Vehicle.

Tincture.

Or of the Tincture of the same may be given $\mathfrak{z}\text{iiij}$ or vj for a Dose, by adding of the Cream of Tartar $\mathfrak{z}\beta$, and if there be need of Sweating, of the Syrup of Pippins $\mathfrak{z}\text{ij}$.

Of Raisins.

Or put to the præscribed Tincture of Corinthian Grapes cleansed $\mathfrak{z}\text{vj}$, let them be digested hot till the Grapes Swell, which being taken forth, evaporate the Liquor to the Consistencie of a Syrup, adding to it of Sugar and cleansed manna, of each $\mathfrak{z}\text{ij}\beta$, then the Grapes being lastly put into it, let the Medicine be kept in a glafs Vessel, close stopped. The Dose from one spoonful to two.

Electuary.

Or add to the aforesaid Tincture, being evaporated to the half part, of fresh Cassia, and of the Pulp of Tamarinds, extracted with antiscorbutick Water, of each $\mathfrak{z}\text{ij}$, of the Conserves of Violets, of Damask Roses each $\mathfrak{z}\text{ij}$, of the Pouders of Senna, of the greater Composition $\mathfrak{z}\text{j}$, of the Pouders of Rhubarb $\mathfrak{z}\beta$, of Cream of Tartar, of the Species of Diatrion Santalon, each $\mathfrak{z}\text{ij}$, let them be bruised together in a Stone Morter, till they are reduced to the form of an Electuary. The Dose about the bigness of a Walnut more or less, according to the success of the Operation.

Pouder.

For those whose Stomachs being full of loathing and will not admit of the Medicines, but in a small quantity and elegant form: Take of the Refine of Scammony gr. iij to viij , of the Cream of Tartar $\mathfrak{z}\beta$, of Celtick Spike gr. vj , mingle them and make a Pouder, let it be given in a spoonful of Gruel, or in the form of Pills.

Purges in a more cold Scurvy.

Those who labour with the scorbutick Indisposition, and are of a more frigid and cold constitution, and where the Disease seems to be founded in a Nitro-Sulphureous disposition of the Blood, like to rosy Wine, are to have administred to them more sharp Catharticks endued with more hot Particles.

Pills.

Take of Stomach Pills with the Gumms $\mathfrak{z}\text{ij}$ of the Refine of Jalap gr. 20 , Vitriolat Tartar gr. 16 , Oyl of Juniper $\mathfrak{z}\beta$, with as much as will suffice of Ammoniacum, soluted in the Water of Earth-worms, make Pills 16, take 4 at a time once in 7 days.

Take of Pillule Tartar of Bontius $\mathfrak{z}\text{ij}\beta$, of the refine of Jalap gr. 12 , of the salt of Tartar $\mathfrak{z}\beta$, with what will suffice of Augustan Syrup, make Pills. 12.

Extract and Syrup.

Take of the Extract of Pil. Ruffi $\mathfrak{z}\text{j}$, of the Extract of black Hellebore $\mathfrak{z}\text{j}$, of the Salt of Tartar $\mathfrak{z}\beta$, with what will suffice of Ammoniack solute, make 9 Pills to be taken, 3 for a dose.

Take

Take of the Leaves of Senna $\mathfrak{z}\mathfrak{j}$, of Rhubarb $\mathfrak{z}\mathfrak{v}\mathfrak{j}$, of Mechoachan, Turbith: with Gums, of each $\mathfrak{z}\mathfrak{j}$, of the Strings of Hellebore black $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, of the Salt of Tartar $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, of yellow Sanders $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, of Winteran Bark $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, being sliced and bruised let them be digested in a Quart of Whitewine for two days, let it be strained without pressing it, and take of it by it self, from $\mathfrak{z}\mathfrak{v}$ to $\mathfrak{z}\mathfrak{vi}$, either in the extract or reduced to a Syrup, or electuary as the Tincture above described, but adding of as much as will suffice of the Powder of Arthritice, or of Diasea.

Or, there is prepared a Tincture of this sort, which may be given to strong men, from half a Spoonful to a Spoonful. Take of Salt of Tartar $\mathfrak{z}\mathfrak{j}$, of the smaller Spirits of Wine $\mathfrak{h}\mathfrak{i}\mathfrak{j}$, let them digest till it becomes Yellow: to this being poured off from its Faeces, put of the Leaves of black Hellebore macerated in Vinegar $\mathfrak{z}\mathfrak{j}$, of yellow Sanders $\mathfrak{z}\mathfrak{j}$, the yellow part of Orange $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, let them digest being close shut up and warm for 3 days. The matter being Strained clear, let it be distilled in Balneo to the half part, the remaining Liquor keep for Use.

Take of sharp pointed Docks, of Polypodium of the Oak, stinking Nettles, and of Chervil, of each $\mathfrak{z}\mathfrak{v}\mathfrak{j}$, of the Leaves of Eupatorium and Betony, each handful, of White Sanders and of Yellow, each $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, wild or bastard Saffron $\mathfrak{z}\mathfrak{j}$, of the Tartar of White-Wine $\mathfrak{z}\mathfrak{j}$, boyl them in three Pints of Spring Water, or $\mathfrak{h}\mathfrak{i}\mathfrak{j}$, till half is consumed, add to it of Rhenish-Wine $\mathfrak{h}\mathfrak{i}\mathfrak{j}$, and presently let it be strained, to which put of the best Senna $\mathfrak{z}\mathfrak{j}$, the Yellow Rind of the Orange $\mathfrak{z}\mathfrak{i}\mathfrak{j}$ Rhubarb $\mathfrak{z}\mathfrak{v}\mathfrak{j}$, of the Leaves of Black Hellebore $\mathfrak{z}\mathfrak{j}$, infuse them being warm and close shut for 12 Hours, being strained, let it be kept in a Glass close stopp'd. The Dose is $\mathfrak{z}\mathfrak{v}$ to $\mathfrak{v}\mathfrak{j}$.

We might here add many other forms of Purges, but there is no great need of variety in these: of the aforesaid, either these or those which shall be thought most convenient, let them be administred, and every 5 or 6 days as occasion shall require iterated. Too often and violent purging, destroys the strength and very much waists the force of the *Viscera*, and in the mean time takes not away the Disease.

After a Purge or two, if there be any need of taking away Blood, let it be done either by Phlebotomy in the Arms, or by Leeches in the Veins of the Fundament. It is not much matter which Vein is Cut: nor is there so much benefit in the opening the Salvatella, as hath been commonly thought. The great do among Authors, who were ignorant of the Circulation of the Blood, about opening the Cephalick, or the Liver Vein, or any other chiefly in the Scurvy comes to nothing. Phlebotomie is indicated by the plentifulness and Vitioufness of the Blood, which rather ought to be performed by taking away a small quantity often, than a great deal all at once: For when the bloody Liquor becomes very impure, it is not more certainly mended by any kind of Remedies, than by letting it forth often and sparingly. For as often as the old corrupted Blood is let forth, fresh, better and more pure succeeds. In the mean time there is need of Caution, lest too great quantity be taken away at once, for its stock being diminished together, Sanguification grows weak, and for that reason a Dropsy, or a Cachexia, or evil disposition of the whole Body follows.

After Purging, and (if need be) Phlebotomy, many other kinds of Remedies, no less necessary, are required in the Scurvy: In the prescribing of which in order, we ought presently to consider whether the Indications being only Præservatory they may have place here, or ought not to be deferred to those which are contrary, to wit, those which respect the more grievous Symptoms: But if you endeavour the whole business of the Cure against the cause of this Disease, proceed according to the following method: It shall be shown hereafter what sort of Cure is to be administred, (if perchance occasion requires) to the Symptoms.

Therefore if the business of Medicine be chiefly designed against the cause of the Scurvy, and that it may be first eradicated by it self for this end, as we shewed but now, there are moreover to be made use of at all times except on the days of purgation, Digestive and Specifick, or antiscorbutick Remedies: to which sometimes if need be, may be added Diaphoreticks, or Diureticks, or Medicines operating by Sweat or Urine. The forms of Medicines, for the performing these kind of Intentions, and manifold Præscriptions, and of various kinds, are every where extant among Authors. It pleases me however, to place here some of the

more

more select, which I think good to distinguish into two Classes, according to the twofold nature of the Scurvy, to wit, the sulphureous Saline, and Saline Sulphureous. And in the first place we will deliver what is convenient in the latter Distemper, to wit, where there is need of Medicines, indued with a certain Incitation, and very much filled with a volatile Salt.

Digestives.

Digestive Remedies, which restore the Ferment of the Ventricle, and help its Function, and also of the other *Viscera* serving to the Chyle; and Antiscorbutick or Specifick, which take away the Dyscrasie of the Blood, are either joyned in the same Composition, or at least they are to be taken successively the same day.

Among the Digestive Medicines, are deservedly ranked, Creme of Tartar, Crystal Salt, and Tincture of Crystal, Vitriolate and Chalybeate Tartar, Elixir *Proprietatis*, simple Mixture: The use of every one of these given twice a day, does oftentimes prove beneficial.

Besides you may easily make with the two following *Menstruums* magisterial Tinctures and Elixirs of divers kinds and digestives, appropriate to the Scurvy.

Take of the Spirit of Vitriol rectified $\mathfrak{z}\text{vj}$, of the Spirit of Wine Alcoholifated $\mathfrak{z}\text{xvj}$, mix them and distil them in a Glass Retort, with three Cohobations: Keep it for use in a Glass very well stopped. The Elixir *Proprietatis*, is better and more easily prepared with this compounded *Menstruum*, than the ordinary way.

Take of Winteran Bark, of *Lignum Aloes*, of the Roots of the lesser Galangal, each $\mathfrak{z}\text{ij}$, of Cinamon, Cloves, Cubebs each $\mathfrak{z}\text{j}$, *Amos* or Bishops Weed and Nasturtium Seeds, each $\mathfrak{z}\mathfrak{ss}$, being bruised, pour on them the aforesaid *Menstruum* till it be 3 Fingers breadth above them, let them digest in a Vessel, in a Sand Furnace for 6 days. Strain it and keep in a Glass close stopped. The dose 20 drops, more or less in a spoonful of Canary Wine or proper Water. Let it be given twice a day.

Take of the whitest Amber, of Gum, Hedera, Caranna, Tacamahaca, each $\mathfrak{z}\text{j}$, of Saffron $\mathfrak{z}\mathfrak{ss}$, of Cloves, Nutmegs, each $\mathfrak{z}\text{ij}$, bruise them and pour on them the aforesaid *Menstruum*, and as before draw forth a Tincture. The dose 20 drops as before.

Take of the Salt of blew Tartar $\mathfrak{z}\text{iiij}$, let them digest with $\text{f}\mathfrak{b}\text{j}$ of the Spirit of Alcoholifate Wine to the Extraction of the Tincture. This is the other *Menstruum*, whereby you may prepare Elixirs out of Gumms, Spices, &c. after the same manner as with the former *Menstruum*.

*Specificks or
Antiscorbuticks.*

Whilst these sorts of Remedies are administred in a small dose morning and evening, or first and last at Medicinal Hours, to wit, before eight in the morning, and four in the after-noon: other kind of antiscorbutick Medicines are to be taken, which for the most part we are wont to prescribe in a double form, to wit, solid and liquid to be taken together, so that the solid being first taken the other may be drunk after it: Of either there are very many Species and ways of Composition extant: viz. in the solid form, Electuaries, Confections, Pouders, Pills, Tablets or Lozenges: In the liquid are Decoctions, Infusions, Expressions, distilled Waters, and medicated Wines and Ale. Of every one of these kinds we will propose some more select Medicines.

Electuaries.

Take of the Conserves of the Leaves of Scurvy-grass, of Roman Wormwood, of Fumitory, of each $\mathfrak{z}\text{ij}$, of the Pouders of Winteran Bark, of the Roots of Angelica, Aron, each $\mathfrak{z}\text{ij}$, of the Species of Diatrion Santalon $\mathfrak{z}\mathfrak{ss}$, of the Pouders of Crabs Eyes $\mathfrak{z}\text{j}$, of the Salt of Wormwood $\mathfrak{z}\text{ij}$, with what will suffice of the Syrup of Citron Peels, make an Electuary.

Take of the Leaves of Scurvy-grass, Conserve of Brook-lime, made with an equal part of Sugar, of each $\mathfrak{z}\text{iiij}$, of the Troches of Capers and of Rhubarb, each $\mathfrak{z}\text{ij}$, of the Salt of Wormwood and of Scurvy-grass, of each $\mathfrak{z}\text{j}$, of the Pouders of Ivory and Coral calcined, of each $\mathfrak{z}\text{j}$, make it up into an Electuary with as much of the Syrup of the Juice of Scurvy-grass as will suffice.

I was wont to prescribe Conserves of the exterior Bark of Limons and Oranges, also of the Purple Flowers of the Ash-tre, of the Leaves and Flowers of Cardamine, of the Roots of Sharp pointed Docks, and English Rhubarb prepared with an

an equal part of Sugar, which of themselves or mixed with other Conservees and *Species* of the same kind are made into an Electuary.

Take of the Conservees of the yellow part of Oranges and Limons, of the flowers of the Ash Tree, of each $\mathfrak{z}\text{ij}$, of the powder of the Roots of *Contrayerva* $\mathfrak{z}\text{j}$, of the lesser Galangal $\mathfrak{z}\beta$, of the Roots of Aron $\mathfrak{z}\text{ij}$, of the *Species Aromatic. rosar.* $\mathfrak{z}\text{j}$, of the salt of Wormwood $\mathfrak{z}\text{ij}$, with as much of the Syrup of Candied Nutmegs, as will suffice to make it up into an Electuary. The dose of these kind of Medicines is the quantity of a Nutmeg, drinking after it some proper Liquor.

For Country people and the poorer sort, for whom less dear and more easily to be prepared Medicines are required, I prescribe after this manner. Take of the leaves of Scurvygrafs and Brooklime, of each $\mathfrak{z}\text{iiij}$, of the whitest Sugar $\mathfrak{z}\text{viiij}$, let them be well beaten in a Mortar together, adding of Winteran Bark powder $\mathfrak{z}\beta$, of Tartar calcined with Nitre $\mathfrak{z}\text{ij}$, with as much Spanish Wine as will suffice, let it be made up into an Electuary. The dose about the quantity of a Walnut twice in a day, drinking an appropriate Liquor after it.

Take of the leaves of Scurvygrafs lbj , of Raisins of the Sun stowed, of white Sugar, each $\text{lb}\beta$, the boylings of wild Radishes $\mathfrak{z}\text{ij}$: Let them be beaten together in a Mortar, and reduced to the form of an Electuary. The dose is about the quantity of a Walnut twice or thrice in a day.

Confections.

Take of Aron compound $\mathfrak{z}\text{j}$, of the powder of Winteran Bark $\mathfrak{z}\beta$, of the *Species of Diatrion Santalon*, of the Troches of Capers, each $\mathfrak{z}\text{ij}$, of the salt of Wormwood and of Scurvygrafs, each $\mathfrak{z}\text{ij}\beta$, of the rinds of Candied Oranges $\mathfrak{z}\text{iiij}$: Let them be bruised in a Mortar together, then add of white Sugar dissolved, in as much as will suffice of the water of Earth Worms $\mathfrak{z}\text{iiij}$, and so make it up into a Confection.

Take of the Roots of *Eryngo* and *Scorzonere* candied, of each $\mathfrak{z}\text{ij}$, of Walnuts and *Myrobalans* candied, each $\text{N}^{\circ} \text{ij}$, of electuary of *Sassaphras* $\mathfrak{z}\text{vj}$, of the powder of Cubebs and Cardamums each $\mathfrak{z}\text{ij}$, of the powder of the Roots of Zedoary, and of Angelica, each $\mathfrak{z}\text{ij}\beta$, of the salt of Wormwood $\mathfrak{z}\text{ij}$, with as much Syrup of candied Walnuts as will suffice: Make a Confection.

Take of the powder of China Roots, of *Sassaphras* wood, each $\mathfrak{z}\beta$, of yellow and white Saunders each $\mathfrak{z}\text{ij}$, of the seeds of Rocket, Cubebs, *Nasturtium*, grains of Paradise, of each $\mathfrak{z}\text{ij}\beta$, of the *Species Dialacca*, Cinnamon, Orris, the lesser Galangal, each $\mathfrak{z}\text{j}$, of the salt of Wormwood $\mathfrak{z}\text{ij}$, of the Conservees of the yellow of Oranges, and of Sugar *anthosar.* $\mathfrak{z}\text{iiij}$, dissolved in as much water of Snails as will suffice, and as before make a Confection: The dose as much as a Nutmeg twice a day, drinking after it some appropriate Liquor.

In some cases of the Scurvy, where there is need of the use of Steel, or of Steel prepared with Sulphur, add of it $\mathfrak{z}\text{iiij}$, or of Vitriol of Steel $\mathfrak{z}\text{ij}$, to any of the prescriptions of the Confections or Electuaries, and after the taking of the Medicine once or twice a day, exercise the Body according to its strength. *Chalybeat Medicines.*

Pouders.

Take of the powder of Aron compounded $\mathfrak{z}\text{ij}\beta$, of Winteran Bark $\mathfrak{z}\beta$, of Cubebs, the grains of Paradise and of Cardamums, each $\mathfrak{z}\text{ij}$, of the salt of Wormwood $\mathfrak{z}\text{iiij}$, of the Orange Tablets $\mathfrak{z}\text{iiij}$, make a Powder: The dose $\mathfrak{z}\text{j}$ in a proper Liquor.

To the aforesaid Powder add of the Nuts of the Indian Fruit *Cacao* $\text{lb}\beta$, let it be brought into a Mass or Paste in a warm Mortar, the dose $\mathfrak{z}\text{ij}$: Let it be taken after the same manner as Chocolate, *viz.* boyled in Spring water with either Rosemary flowers or Betony, or with the Roots of *Scorzonere*, or also with the shavings of Ivory or Hartshorn.

Pills.

For those who had rather have the Medicine in a lesser dose, and form of Pills; take of the Roots of Virginian Snakeweed, *Contrayerva*, each 3ij, of Winteran bark, seeds of Rocket and of Cubebs, each 3iij, of the salt of Wormwood and of Scurvygrafs each 3jß, of the extract or the rob of Juniper 3ß, and with a sufficient quantity of the Syrup of preserved Nutmegs, make a Mass: Dose 4 Pills a day, drinking after them some proper Liquor.

Tablets or Lozenges.

For the more delicate Tablets or Troches are prescribed after this manner: Take of the powder of Winteran Bark, of the eyes of Crabs, each 3iß, of the powder of Pearls 3ß, of the finest Sugar 3vj, dissolved in as much water of Earthworms as will suffice, and boyled up to the height of Tablets: Add of the Spirits of Scurvygrafs 3ij, of which make Lozenges or Tablets, each weighing 3ß, take about 3j twice a day, drinking an appropriate Liquor after it.

The Orange Tablets sold in the Apothecaries Shops in Oxford.

TAke of the Rinds of Oranges, Limons, and Citrons preserved, of each 3j, of preserved *Eringo* Root 3ß, of Pine Nuts and Pistaches each 20, of sweet Almonds blanched number 10, of the powder of Anniseeds 3ß, candied Ginger 3ij, *Species of Aromatic. Rosat.* and of Nutmeg each 3j, of the Roots of Galanga 3j, ten Cloves, of Amber grieße gr. iiij, of Musk and Civet of each ij grains, of the whitest Sugar 3ß dissolved in Rose water, and boyled up to a Tablet: Of which make Troches or Lozenges as before.

Liquid Medi-
cines.

So much for Medicines in a solid form or more thick substance, that are wont to be given to scorbutical persons: That the virtue of which might be the better and with the greater benefit, carried into the mass of Blood, for the most part liquids are prescribed to be drunk after them: Although great variety of them and divers ways of compounding them are extant, yet the chiefest and most usual are those we mentioned above, and shall now subjoyn the forms of each of them.

1. Decoctions.

Although Decoctions are the most familiar kind of liquid Medicines, yet more rarely made use of in the Scurvy, because the simples which are chiefly beneficial to this Disease, as Scurvygrafs, Brooklime, &c. lose their virtues received from the volatile Salt by boyling; yet because Remedies by this means are easily and suddenly prepared, they ought to be admitted sometimes, for that it has been found by experience, that they have some efficacy. For Country and poor People, an easie Medicine by this preparation is commended by many Authors. Take of the leaves of *Nasturtium Aquaticum* or water Cresses iij handfuls, of the lesser Sorrel m ij, being bruised let them be macerated or steeped in six pints of Milk, and then boyled till the third part be consumed: Take of it from 6 to 8 ounces twice a day. A Decoction of Wormwood is praised by *Engalenus* and others, the following Remedy I have often tryed with good success. Take of the tops of Broom m iij, cut small and boyled in 3 pints of strong Ale till half be consumed; let it be taken from ij to iij ounces twice in a day.

2. Infusions

2. *Infusions.*

An Infusion being added to the Decoction, makes a most profitable Medicine. Take of the Roots of *Scorzonere*, of Chervil, each \mathfrak{zj} , of the leaves of *Eupatorium* and *Chamepitys*, each $m\beta$, of burnt Hartshorn \mathfrak{zij} , of Raisins $m\beta$, boyl them in in 3 pints of Spring water till the third part be consumed, add then of Rhenish Wine half a pint, and presently strain it into a glass vessel, to which put of the leaves of Scurvygras and Brooklime each half a handful, of the rinds of Oranges steeped and cut small $\mathfrak{z}\beta$, make an Infusion warm and close stopped for six hours, strain it and let it be kept in a close Vessel: The dose \mathfrak{zvj} twice in a day after a solid Medicine.

Take of Whey made with Whitewine or Cider $\mathfrak{fb}\beta$, boyl in this of the Roots of Burr docks and *Eringoes* steeped, of each \mathfrak{zvj} , of preserved Juniper Berries $\mathfrak{z}\beta$, the liquor being boyled away to the third part, let it be strained into a Jugg, to which let there be put of the leaves of Scurvygras and of Brooklime each $m\j$, make an infusion warm and close stopped for 6 hours: The dose half a pint twice in a day, after a solid Medicine.

Sometimes Infusions made by themselves are of notable use. Take of the leaves of Scurvygras $m\j$, the slices of Horse-radish Roots $m\beta$, Winteran Bark bruised \mathfrak{zij} , let them be put in a glass Vessel with Whitewine or Cider, and Scurvygras water, each \mathfrak{fbj} , let an Infusion be made in a Cellar for 2 or 3 days: The dose \mathfrak{zvj} to \mathfrak{viij} twice in a day as before.

3. *Juices and Expressions.*

'Tis also a very commendable use to take twice or thrice a day, of the Juice of antiscorbutick herbs or fruits or their expressions, by themselves or with their appropriate Liquors, for so it is presumed, the virtue of the Remedy is exhibited whole and undiminished.

Take of the leaves of Scurvygras, of water Cresses and of Brooklime each $m\mathfrak{ij}$, being bruised let the Juice be wrung out hard, and kept in a close Vessel: The dose $\mathfrak{z}\mathfrak{ij}$ to $\mathfrak{z}\mathfrak{iiij}$ twice in a day, in a draught of Ale; Wine, or distilled Water.

Take of the leaves of Scurvygras $m\mathfrak{iiij}$, of Wood-forrel $m\mathfrak{ij}$, being bruised let the Juice be pressed forth, which being put into a Glass close stopped will quickly grow clear; for the sharpness of the Wood-forrel precipitates the thicker parts of the Scurvygras: The same also happens if the Juice of Oranges is mingled with the Juice of Scurvygras, the dose $\mathfrak{z}\mathfrak{ij}$ or $\mathfrak{z}\mathfrak{iiij}$ twice in a day.

Take of the leaves of Scurvygras $m\mathfrak{iiij}$, of Brooklime and of water Cresses each $m\mathfrak{ij}$, of long pepper $\mathfrak{z}\mathfrak{iiij}$, of the shavings of Horse-radish $\mathfrak{z}\mathfrak{ij}$, all being bruised together let them be put into a glazed Vessel, with Rhenish or Spanish Wine which is best liked \mathfrak{fbj} , the mouth being very close shut, let it stand in a cold Cellar for two days, then let it be pressed forth strongly: The dose is $\mathfrak{z}\mathfrak{iiij}$ twice in a day, after a solid Medicine.

Take of the leaves of Scurvygras $m\mathfrak{ij}$, of Brooklime and water Cresses and of Wood-forrel, of each $m\mathfrak{j}$, being bruised pour on them of the water of Snails and of Earthworms each \mathfrak{zvj} , make an Expression strongly, which keep in a Glass close stopped: The dose $\mathfrak{z}\mathfrak{ij}$ twice a day.

4. *Syrups.*

For the same reason as Decoctions so also Syrns are but little used in the Scurvy, for as much as the virtue of the simples chiefly efficacious, evaporates in the boiling; yet because there is need sometimes for sweetning of appropriate Liquors with such a Medicine for some; we will propose here our preparation, the strength of the ingredients being preserved as much as may be.

Therefore take of the leaves of Garden Scurvygras $m\mathfrak{vj}$, of the rinds of 4 Oranges and two Limons cut very thin, of the slices of Horse-radish $m\beta$, of long pepper powdered $\mathfrak{z}\mathfrak{ij}$, all being bruised together let the Juice be pressed forth, which being

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presently

presently put into a close stopped Glas, place in a cold Cellar till it settles and grows clear, then the Liquor being clear pour it off softly into another glass, and being fast shut let it be kept warm in *Bainco Maria*: In the mean time for every ounce, take of Sugar $\mathfrak{z}\text{ij}$, and let all the quantity be dissolved in as much of the water of Earthworms, and boyled up to a thickness, to which let the aforesaid Liquor be poured by degrees, warm and stirred together with a *Spatula*: As soon as it is incorporated let it be taken from the fire, and being cold let it be put into a glass, and in this hang tyed up in a little Rag; of Cinnamon bruised $\mathfrak{z}\text{ij}$, of the seeds of water Cresses, and of Rocket powdered and mingled together, of each $\mathfrak{z}\text{j}$.

5. Distilled Waters.

Distilled Waters because they are a neat and pleasant Remedy, fill almost every Page among the anti-scorbutick precripts: Some dispensations of these esteemed very profitable and fit, are in our *Pharmacopœa*; as the compound water of Radishes, and the magisterial of Earthworms and of Snails. Besides, there are extant very famous prescriptions of these sorts of Waters, delivered by *Quercetanus*, *Dornrelius*, *Semertus*, *Doringius*, and other Authors. Moreover every Physician is ready to prescribe as occasion serves, such like appropriate to the condition of every sick Body; for the anti-scorbutick Ingredients and others added, which may respect particular Distempers being received, and being cut, sliced, and bruised, are put into some convenient Liquor, to wit, Whitewine, Cyder, or the Whey of Milk made by either of them; then let the whole mixture be distilled in a Cucurbit or in a Rose Still: We will here subjoyn one or two forms used by us.

Take of the leaves of both the Scurvygrasses, of Brooklime, of water Cresses, and the tops of Broom of each $m\text{ iij}$, of the leaves of Germander and *Chamepitys* or ground Pine each $m\text{ ij}$, of the Roots of Horse-radish $\mathfrak{t}\mathfrak{b}\mathfrak{ss}$, of Aron, Angelica, *Imperatoria* or Master-wort each $\mathfrak{z}\text{ij}$, the outer peels of 4 Oranges and of as many Limons, of the Roots of *Calamus aromaticus* $\mathfrak{z}\text{j}$, of Cinnamon, Cloves, each $\mathfrak{z}\mathfrak{ss}$, being bruised and cut pour to them of the best Cyder $\mathfrak{t}\mathfrak{b}\mathfrak{v}\mathfrak{ij}$, let them digest for two days in a glazed pot close shut, then let them be distilled in a common Still, the first and last water being drawn off let them be mixed together.

In Winter time when green herbs are not to be had, we prescribe after this manner: Take of the leaves of Scurvygrass $m\text{ iij}$, the tops of Broom, Pinetree, and Juniper, of each $m\text{ iij}$, the middle bark of the Elder Tree and of the Ash Tree each $\mathfrak{z}\text{ij}$, of the Roots of Horse-radish and of *polygody* of the Oak, each $\mathfrak{z}\text{ij}$, the rinds of 4 Oranges and of as many Limons, of Winteran Bark $\mathfrak{z}\text{ij}$, being cut and bruised put them into 8 pints of Whitewine or Cyder, or the Whey made of either of them, and let them be distilled.

The simple water of the leaves of Aron being distilled in the Spring time, is an efficacious Remedy against the Scurvy, if it be taken to the quantity of 3 or 4 ounces twice a day with some other Medicine.

The simple water of Scurvygrass being poured upon fresh leaves bruised and distilled, and so often reiterated with new cohobations, becomes an effectual Remedy: Moreover, the strong Spirit of Scurvygrass is prepared after this manner. Take of the leaves of Scurvygrass as much as will suffice, being bruised let them be made up into Balls such as those of Woad which the Dyers use, then pour upon those Balls being put into a well glazed Pot, either as much of the water of Scurvygrass or of Wine of the same herb, as will cover them at least 4 fingers, and let them be kept exactly shut for 3 or 4 days in some cool place, then let the whole matter, being put into an Alembick be distilled: Let the distilled water, being put into a Cucurbit, be rectified, at first there goes forth the strong Spirit, of which may be taken in a fit Vehicle from 15 to 20 drops.

6. Anti-scorbutick Wine and Ale.

I was wont to prepare simple anti-scorbutick Wine of excellent use, after this manner in the Spring or Summer time. Take of the leaves of Scurvygrass gathered in a clear day as much as you please, being bruised and the Juice pressed forth, fill a Vessel

Vessel of 3 or 4 Gallons with it, and putting thereto 1 or 2 spoonfuls of Yeast, let it stand to ferment for two days; then the Vessel being close shut let it be put into a Wine Cellar for 6 months, then the Liquor being clear and of colour like Spanish Wine, draw it forth into Bottles and keep it for use: It may be kept good and incorrupt for many years, the dose $\mathfrak{z}\text{ij}$ or iiij twice in a day.

Medicated Wines, of which may be taken 4, 3, or 2 ounces at medical hours daily, as also at Meals, are prepared after this manner: Take of Scurvygrafs leaves m iij , shavings of wild Radishes $\mathfrak{z}\text{ijij}$, of Winteran Bark $\mathfrak{z}\beta$, of the outer rind of 4 Oranges and of as many Limons, and let them be put into a glass with 12 pints of White-wine, Rhenish, or thinner Spanish Wine: The Vessel being close shut up let it be kept in a cold place, and as often as you need, draw the Wine off clear.

It is a usual thing to prescribe for scorbutical persons, medicated Ale or Beer to be drunk constantly for their ordinary drink: Let Ale or Beer be prepared as much as will fill a 4 Gallon Vessel, and instead of Hops boyl therein of the tops of the Pine or the Fir-tree m iij , and after it hath fermented in the Vessel, let there be put to it of the leaves of Scurvygrafs m iij , of the roots of sharp pointed Docks prepared $\mathfrak{z}\text{ijij}$, the rinds of 4 Oranges, and after it hath stood 7 days drink of it.

These sort of medicated Ales may be prepared with other ingredients, according to the affection or temperament of the Patient, by which kind of Remedy the medicinal Particles altering the dyscrasie of the Blood, being continually carried into its Mass together with the Aliments, many have found much benefit in taking away the cause of the Scurvy. But for as much as we have shewn the cause of this, even as the *species* of the Disease to be two fold, and that hitherto the Medicines proposed, respect only the saline-sulphureous intemperature of the Blood: In the next place it behoves us to add scorbutick Medicines, which are convenient in the other, viz. in the sulphureous-saline dyscrasie of the Blood.

CHAP. VIII.

Of Medicines of every one of the aforesaid Forms respecting the Scurvy, being excited in a more hot Constitution, and sulphureous-saline Dyscrasie of the Blood.

IN some scorbutical persons, the using much of the aforesaid sharp things, as Scurvygrafs, Horse-radish, Winteran Bark, and others endued very much with a volatile salt, hath been found hurtful: Wherefore in such like cases where the morbidick cause consists in a more hot dyscrasie of the Blood, like to rosy wine, temperate Medicines less agitating the particles of the humors, apt to grow hot of themselves are prescribed: Wherefore we will here add the forms in the same order as the former, and first we will begin with the solid Remedies.

Electuaries.

Take of Conserves of Brooklime, Cardamines, made with an equal part of Sugar, of each $\mathfrak{z}\text{ij}$, of the *species* of *Diatrion santalon*, and of *Diorrodon Abbatis* each $\mathfrak{z}\text{j}$, of the powder of Ivory $\mathfrak{z}\text{j}$, of Pearls $\mathfrak{z}\beta$, of the salt of Wormwood and of Tamarisk each $\mathfrak{z}\text{j}$, and as much as will suffice of the Syrup of Coral, make an Electuary.

Take of the Conserves of wood Sorrel, and of Cynorrhodon or of Hyps each $\mathfrak{z}\text{ij}$, (or of the Conserves of sharp pointed Docks, and of the roots of Succory each $\mathfrak{z}\text{ij}$) of the troches of Rhubarb $\mathfrak{z}\text{ij}$, of the *species* of *Diamargarit. frigid.* $\mathfrak{z}\text{i}\beta$, of Tamarisk Bark $\mathfrak{z}\text{j}$, of *Sal Prunellæ* $\mathfrak{z}\text{i}\beta$, preserv'd *myrobalans* 2, and with what will suffice of the Syrup of preserv'd *Myrobalans*, make an Electuary.

For the Poor I was wont to prescribe this more ready Medicine. Take of the Leaves of Brook-lime $\mathfrak{z}\text{vj}$, of wood Sorrel $\mathfrak{z}\text{ij}$, of white Sugar $\mathfrak{z}\text{viii}$, let them be bruised and beaten together, by adding to it of the Flower of sweet Fenil Seeds $\mathfrak{z}\mathfrak{ss}$, of the Pouder of Ivory $\mathfrak{z}\text{ij}$, of *Sal Prunella* $\mathfrak{z}\mathfrak{ss}$, with what will suffice of the Syrup of the Juice of Brooklime, make an Electuary.

Confections.

Take of the Pouder of China Root, and of the Male Pæony, each $\mathfrak{z}\text{j}$, of white and yellow Sanders, each $\mathfrak{z}\text{iiij}$, of Ivory $\mathfrak{z}\mathfrak{ss}$, of Pearls $\mathfrak{z}\mathfrak{ss}$, of Crabs Eyes $\mathfrak{z}\text{j}$, of Coral being steeped in the Juice of Orenge, and ground on a Marble $\mathfrak{z}\text{ij}$, of the whitest Tartar $\mathfrak{z}\mathfrak{ss}$, of white Sugar $\mathfrak{z}\text{vj}$, dissolved in as much water of *Scordium* compounded as will suffice. Make a Confection.

Take of the candied Eryngo Roots, and of Scorzonere, each $\mathfrak{z}\text{ij}$, of the Pouder of Aron Compound $\mathfrak{z}\mathfrak{ss}$, of the Species of *Diatrion Santal.* $\mathfrak{z}\text{ij}$, of *Sal Prunella* $\mathfrak{z}\text{j}$, with what will suffice of the Syrup of Cloves. Make a Confection.

Pouders.

Take of the Pouder of the Leaves of *Chamæpitys*, and of Aron Compounded, each $\mathfrak{z}\mathfrak{ss}$, of Ivory Pouder, of red Coral prepared with the Juice of Orenge, each $\mathfrak{z}\text{ij}$, of the Orange Tablets $\mathfrak{z}\text{ij}$, mingle them and make a Pouder, dose 1 Spoonful twice in a day.

Pills.

Take of the Species of *Diatrion Santal.* of *Diamargarit. Frigid.* each $\mathfrak{z}\text{ij}$, of the Seeds of Citron and of *Carduus* bruised, each $\mathfrak{z}\mathfrak{ss}$, of the Roots of Cretian Ditany, and of the male Pæony, each $\mathfrak{z}\mathfrak{ss}$, of the Salt of Tamarisk $\mathfrak{z}\text{ij}$, with what will suffice, of the Gelly of Harts Horn or Snakes Skins, make a Mass.

Tablets.

Take of Species *Diatrion Santalon*, of *Diamargarit. Frigid.* of each $\mathfrak{z}\mathfrak{ss}$, of Perls powdered, of red Coral prepared, of Pouder of Ivory, each $\mathfrak{z}\text{j}$, of Sugar $\mathfrak{z}\text{vj}$, dissolved in Water of *Scordium*, and boyled up to a Consistence, make Tablets as before.

If that with these sort of temperate Antiscorbuticks, there shall be any need of the use of Steel, let there be added to the Electuary or the Confection, or also to the Mass of Pills, of the Magisterium of Steel of *Myusythus*, or of the extract of Steel of our preparation $\mathfrak{z}\text{ij}$: In some cases of *Crocus Martis* about $\mathfrak{z}\mathfrak{ss}$ or $\mathfrak{z}\text{iiij}$ may be added to the like Composition: But it seems better to give the Chalybeates in the Liquors to be drunk after the solid Medicines, than to put them into the aforesaid Compositions. It remains now that we prescribe the forms of the Liquors.

Decoctions.

In the Scurvy excited after a long continued Fever, these sort of Decoctions are given with benefit, which may purify the Blood and plentifully move Urine.

Take of the Roots of Chervil, Scorzonera, Sorrel, Parsely, of each $\mathfrak{z}\text{j}$, of the Leaves of Agrimony, and Harts Tongue, each $\mathfrak{m}\text{j}$, of Harts Horn burnt $\mathfrak{z}\text{ij}$, of the Rinds of 3 Apples, of Corinthian Grapes $\mathfrak{z}\text{ij}$, of Liquoris $\mathfrak{z}\text{iiij}$, let them be boyled in 4 Pints of Spring Water till the third part be consumed, add to it of *Sal Prunella* $\mathfrak{z}\text{ij}$, or $\mathfrak{z}\text{iiij}$. The dose $\mathfrak{z}\text{vj}$, twice or thrice a day.

Take of preserved Eryngo Roots $\mathfrak{z}\text{vj}$, of Grass Roots $\mathfrak{z}\text{ij}$, of the Leaves of Goose-grass

grass or Cleavers, *mij*, of Agrimony and of Liver-wort, each *mij*, of Raisins of the Sun *ʒij*, of white Sanders *ʒj*, of Liquorish *ʒij*, let them be boyled in 4 Pints of Spring Water, to the Consumption of the third part. The dose *ʒvj*, after a solid Medicine.

For Country, and the poorer sort of People, that they might not fall into the Scurvy after a Fever, I was wont to prescribe that they should take twice a day this following draught; *viz.* Take of the Roots and Leaves of Dandelyon *mijʒ*, let them be boyled in a Pint and half of Posset Drink till the third part be consumed: let it be strained and serve for two doses.

Or Take of the Roots of Dandelyon *mijʒ*, of Citron, and *Carduus* Seeds, each *ʒj*, let them be boyled in a Pint and a half of Posset Drink made of Apples or Cyder; till the third part be consumed.

Infusions.

The Apozems but now prescribed become more powerful against the Scurvy, if being prepared without Liquoris, they be strained into a Jugg, into which let there be put of the Leaves of Brook-lime and of water Cresses or Cardamines, each *mij*, then make an Infusion warm, and close shut for 6 Hours. The Liquor at last being strained, let it be kept in close Vessels. The dose *ʒvj* twice or thrice in a day. Also make an Infusion of Whey boyled with the Roots of Dandelyon, or the Leaves of Fumitory strained into a Vessel with one handful of the Leaves of Brook-lime, and as much of Celandine the lesser.

Chalybeate Infusions are wont to be of frequent Use, to wit, of the Salt of Steel, or of the Magistery or Extract put into some Decoction or distilled Water; but as the natural Water or Spaws, so also the Artificial, of our preparation of Steel dissolved in Spring Water, and impregnated with the Infusion of Antiscorbuticks, hath been drunk with very notable Benefit.

Juices and Expressions.

Take of the Leaves of Brook-lime, of water Cresses, each *miiij*, of wood Sorrel *mij*, being bruised let the Juice be wrung forth, and let it purify in a Glass close shut, which it will soon do. The dose is *ʒijʒ*, to 7 Ounces in a convenient Vehicle.

Take of the Leaves of Brooklime *miiij*, of the Branches or strings of English Rhubarb *mij*, being bruised let the Juice be pressed forth.

Take of the Leaves of Brooklime, of Cresses, of Cardamines, of the lesser Celandine, of wood Sorrel, each *mij*, being bruised let the Juice be pressed forth, add to it a fourth part of the Juice of Oranges: Let it be kept in a Glass.

Syrups.

As often as there is any need of Syrup for any other Composition, we make use of either the Compound Syrup of the Juice of wood Sorrel, or of Fumitory, or of Coral; or also a Magistral of the Juice of Brooklime may be prepared after the same manner, as we before prescribed concerning the Juice of Scurvy-grass.

Distilled Waters.

Distilled Waters more temperate are prepared, either by changing the ingredients, or the *Mestruum*, or both.

As to the first, proceed after this manner. Take of the Leaves of Brooklime, Garden Cresses, Fumitory, Harts Tongue, Liverwort, Baum, the tops of Tamarisk and Cyprus, of each *ʒijʒ*, of the Roots of sharp pointed Docks, of the Poly-pody of the Oak, each *ʒij*, of the outward Bark of four Oranges, of cleansed Snails

Snails lbij, being cut and bruised pour on them of Whey made of Syder lbvj, let them be distilled in a common Distillatory.

2. As the *Menstruum* is more weak, let the Ingredients be moderately hot.

Take of the Leaves of Scurvygrafs, of Brooklime, of Water and Garden Cresses, each miiij, the Rinds of 4 Orenge, a pint of Snails, being all cut small, pour to them of the common Whey of Milk, or fresh Milk lbvj. Let them be distilled in the ordinary way.

3. In the Scorbutick Atrophie and Tabid Disposition, where no hot thing agitating the Blood, Spirits and Humours ought to be admitted; both the Ingredients and the *Menstruum* ought to be temperate, and sweetning the Blood.

Take of the Leaves of Brooklime, of Cardamines, Harts Tongue, Maiden Hair, Liverwort, Betony, Agrimony, of each mij, of Snails cleansed lbjß, (or the soft flesh of a Capon, or the Heart of a Sheep cut to pieces) being all scalded and cut, let them be bruised together, and then pour to them six Pints of fresh Milk (or Fumitory Water) and let it be distilled after the ordinary way.

Medicated Wines and Ale.

Although the use of Wines seems to be less agreeable in the Scurvy, excited by reason of heat, or the Sulphureous-Saline Dyscrasie of the Blood, yet when either the Stomach is more weak, or that by long custom, they at least require drink of Wine mixed with a little Water; the same sort of Liquor ought to be prepared, both more temperate and also medicated. And first of all may be granted them small Wines diluted with Water, and impregnated with the Infusion of Baum, Borage, or of Pimpinell or Burnet, or others.

Moreover Wines are prepared of the Juice of Currants, Rasps, Cherries, and of other garden Fruit, which being ripened by fermentation become very grateful to the Stomach, and purify the Blood; Then Cyder, the familiar and almost genuine Wine of our Country, so it be clear, sweet, soft, and without any sharpness, helps very much in the Scurvy. Besides to this Liquor, being freed from its Fæces, and put up into little Vessels, may be put ingredients of various natures or kinds; viz. of which sort are the tops of Pine or Fir-tree, the Flowers of Tamarisk, also the shavings of Harts-Horn, or Ivory, which will sweeten the Liquor and preserve it from growing sour; for as much as the Particles of the fluid Salt abounding in the Cyder, being apt to cause it to grow sour of itself, are hindered by dissolving the foresaid Ingredients.

The more temperate medicated Ale or Beer, is prescribed after this manner. viz. let there be Ale prepared to fill a small Vessel, holding 5 or 6 Gallons, in which instead of Hops, let there be boyled the tops of Pine or Fir Tree, or of Tamarisk, or the shavings of any of their Woods, then after it hath worked, put into the Vessel the Roots of sharp-pointed Docks dried, (than which certainly there is not a more helpful remedy in the Scurvy) to these sometimes may be added the Leaves of Brooklime, Watercresses, Barberries, and also Orenge and Limons sliced may be put into the Vessel.

The Leaves of Harts Tongue, put into the Vessel of small Ale, after fermentation, gives it a most grateful taste and smell.

CHAP. IX.

Of the Curatory Indication of the Scurvy, by which help is afforded to the Disease it self, and to the Symptoms chiefly afflicting.

WE have hitherto treated concerning the Cure of the Scurvy, and shewed what belongs to the preservatory indication, to wit, the taking away of the morbidick cause, viz. both the intentions of healing and manifest Remedies. Which kind of method being timely entred upon and rightly instituted, oftentimes performs the whole business, for that the cause of the sickness or the Root being cut off, the distempers depending upon it wither away of their own accord. But yet we may not always follow this course directly, but sometimes stepping of one side, go another way to work, because sometimes more grievous accidents and symptoms happen, which require peculiar and as it were extraordinary help of Medicine, which ought to be attended upon immediately, and the general Cure often interrupted: As to this it is to be observed, that when the distempers which follow upon the Scurvy, require proper Remedies according to the nature of every one of them, and the disposition of the Patient, yet there ought always to be mixed with these Anti-scorbuticks. There will be no need to institute a curatory method, against all the diseases and distempers with which the Scurvy is wont to environ one, for so I might transcribe the whole practice of Medicine, but we shall have regard only to the symptoms chiefly afflicting, by which either the life of the Patient is endangered, or the principal Cure is hindred: By what means and with what Medicines such may be cured, we shall now shew.

Of the Curing difficult Respiration and Asthmatical Paroxysms.

Difficult breathing with straitness of the Breast and asthmatical fits, ought to be taken away by appropriate Remedies, and to be prescribed besides the general method, otherwise the sick may be soon brought into danger of life. As these kinds of evils arise for the most part in scorbutical persons, by the vice of the Blood stagnating in the heart, or by reason of the pneumonick Nerves, being hindred in their function, so they are to be cured with Cardiacks or anti-spasmodick Medicines, viz. of Hartshorn, Soot, Blood, of mens Skulls, also the tincture of Castor, Antimony, or of Sulphur, the flowers of *Sal Armoniac*, the flowers of Benjamin, also *Elixir Proprietatis*, in these cases are of excellent use: Which kind of Remedies may be given at every turn, with a dose of some anti-scorbutick Liquor, proper also against the aforesaid distemper. For the sudden allaying of difficult breathing, merely spasmodical when it afflicts very sore, Luever found a more ready Remedy than 10 or 12 drops of our tincture of opiate *Laudanum*, being given in some convenient Liquor, for that sleep creeping on the Spirits remit their inordinations, and being in the interim refreshed, they resume afterwards their pristine task after a due manner. The more sharp Clysters which very much cleanse the Belly, also sudorifick Decoctions and Diureticks often give help.

Take of the Roots of Bur Docks, of Butter Bir, Chervil, each $\mathfrak{z}\text{ij}$, of the leaves of Maiden hair and *Germander* each mij , of bur Dock and bastard Saffron seeds each $\mathfrak{z}\text{iii}$, of Raisins $\mathfrak{z}\text{ij}$, being cut and bruised let them be boyled in Spring water $\mathfrak{f}\text{biii}$, to the consumption of the third part, add of Whitewine $\mathfrak{z}\text{iii}$, let it be strained into a Jag, to which put of the leaves of Scurvygras cut mij , of the roots of candied *Enula Campana*, and cut small $\mathfrak{z}\mathfrak{ss}$, let them infuse hot and close shut for three hours: The dose $\mathfrak{z}\text{vj}$ twice or thrice a day.

Of the Distempers of the Ventricle, that are wont to follow upon the Scurvy.

Sometimes scorbutical People are wont to be cruelly tormented with great pain and fulness of the Ventricle, also with a nauseousness and belchings, and sometimes also with cruel and frequent vomiting. Which kind of vices arise sometimes from the Chyle, being there degenerated into a putrefying humour, but more often from the morbid matter being carried away, either by the passage of the Blood or the nervous Juice, and deposited either in the cavity of the Stomach, or fixed in the nervous folds and membranes. In these cases if a viscid or ropy stinking matter, or otherways hurtful be cast out by vomiting, and that it be suspected that the cause remains within the cavity of the Ventricle, a gentle Vomit of wine of Squills, or of vitriol Salt, will be convenient to be taken: Or if the peccant humour disturbs the Belly, either an extract of Rhubarb or an infusion of it, the Salt or Cream of Tartar being added. But if the matter sticks closely within the Membranes or nervous foldings, Diaphoreticks, or things restraining the effervencies of the Salts rather help: *Elixir Proprietatis*, or the flowers of *Sal Armoniac*, or the Spirits of Soot may be taken by turns, with the water of Radishes compound, or of Snails, or any other anti scorbutick Liquor. In the mean time, once or twice in a day there may be applied to the region of the Stomach, a fomentation of Wormwood, Centaury, Camomil Flowers, the Roots of Gentian and others, boyled in Whitewine, with woollen Stuphs dipt in it and wrung out very hot. The use of Clysters is convenient, and not seldom Opiates yield great help.

Of the Pain of the Belly and Scorbutick Colick.

There is almost no Distemper requires the speedy help of Medicine more than the Colick and torments of the Belly, which frequently happen in the Scurvy. Against these evils, Clysters of several sorts, Fomentations, Liniments, and Cataplasms are administred. Here the use of Opiates are thought to be very necessary, certainly in this case that prescript of *Riverius*, that purging Pills should be administred with some *Laudanum* mixed with them, may take place; for by sleep being moved, and a plentiful solution of the Belly being caused, very often the fits are taken away: But the pouders of Shell-fish, by which the acetous Salts are imbibed or fixed, conduce very much to the profligating or driving away the morbid cause. As for example, take of the powder of Crabs eyes, and of Egg shells each ʒiʒ, of Pearls ʒi, make a powder, let it be divided into 12 doses, let one of which be taken every sixth hour, with scorbutick water or with the decoction of the Seeds and Roots of Burdocks, as is above described, or else with posset drink, in which is boyled the Roots and seeds of Burdocks, the leaves of sweet Marjoram, and Saxifrage, and the leaves of Scurvygras infused. In the scorbutick Colick, also in the distempers of the Ventricle, but now described the use of *Epsom* and *Barnet* purging waters or the like, affords oftentimes very great benefit.

Of the Lask and Dysenterical Distempers.

An inveterate *Diarrhoea* such as often happens to scorbutical persons, ought in no wise to be stopped with astringent Medicines, nor is it easily cured by alteratives or every Anti-scorbutick: Purging waters impregnated with iron or vitriol are the best Medicines for this distemper: Next to these are the artificial spaws or chalybeate medicines, which are wont to give notable help. *Crocus Martis* rightly prepared is to be preferred to all others, I have used the following method with good success: First a Purge of the powder or the infusion of Rhubarb is to be instituted, with astringent Spices added, and often to be repeated every three or four days. In the other days, let a dose of the following Electuary of the bigness of a Nutmeg be taken in the morning, and at 4 a Clock after noon. Take of the Conserves of common Wormwood made with an equal part of Sugar ʒvj, (in a more hot constitution, instead of this let Conserves of red Roses be taken) *species Diarrhodon Abbaris* ʒij,

3ij, of the powder of white and red Sanders each 3i, of *Crocus Martis* the best 3ß, with what will suffice of the Syrup of Steel, make an Electuary.

In dysenterical distempers or a *Tenasmus* or desire of going to Stool, you must proceed after the like method; if it may be had, let the use of purging waters be instituted, besides let often Clysters prepared of vulnerary decoctions be used. Lately I cured one greatly labouring with a tedious dysentery, who had for a long while voided by Stool many ounces of Blood, by this Medicine. Take of the best Rhu-barb in powder 3i, of the powder of red Sanders 3ii, of Cinnamon 3i, of *Crocus Martis* 3iij, of *Lucatella's* Balsom what will suffice to make a pilulary Mass, he took 4 Pills sometimes every day and sometimes every other day for a Week, and was perfectly cured. I also prescribed him to drink medicated Ale constantly, with the roots of sharp pointed Docks, and the leaves of Brooklime infused in it.

Of the Vertigo and fainting of the Spirits and other Distempers, that are wont to be joyned to the same scorbutical Affection.

The *Vertigo* often comes upon an inveterate Scurvy, to which is wont to be added a fainting or frequent sinking of the Spirits, and almost a continual fear or dread of it, also a stupor or stiffness in the members, and a sense of tingling or pricking here and there running about them, which kind of distempers proceed from the failure of the animal Spirits in the fountain it self, and sometimes of those within the Nerves, both the Cardiac and those serving for the motion of the Members; and when they depend on the Brain and nervous stock, being beset very much with the scorbutick Salt, they are not easily cured. Cephalick Remedies, such as are convenient in the *Vertigo* and paralytick Diseases excited by themselves, are to be administered with anti-scorbuticks mixed therewith: Therefore first of all a provision of the whole being made by fit Catharticks, and such as are convenient in the Scurvy, you may proceed with appropriate Remedies against the said Disease after this manner.

About the beginning of the Cure, let there Blood be taken from the veins of the Fundament by Leeches, and unless any thing may contradict, let it be at several times repeated.

Take of the powder of the male Peony root 3ß, of red Coral prepared 3ij, of an humane Skull and of Elks Claws each 3i.

Take of the best Sugar dissolved in the compound Peony water, or in the water of wild Radish, and boyled up to a consistence 3viii, of the best oyl of Amber rectified 3ß, make thereof Tablets, and take of them from 3iß to 3ii morning and evening, drinking after it a draught of the following distilled Water.

Take of the leaves of Scurvygrass, of Brooklime, of Cresses of the Garden, of the Lillies of the Valley, of Sage, Rosemary, and Betony, each *m* iii, of green Walnuts lbvi, of the rinds of 6 Oranges and of 4 Limons, of the fresh roots of the male Peony lbß, being bruised and cut, let there be put to them of the phlegm of Vitriol lbj, of Whey made with Cyder lbv, let them be distilled after the ordinary way, and let the whole water be mixed together: The dose 3iij to 3iiij.

Of Hemorrhagies or Fluxes of Blood.

Great fluxes of Blood very often threaten great danger in the scorbutick distemper, in so much as the sick are given over, for that reason to sudden death, whilst the Blood breaks forth now from the Nose, now by the menstrual Flux or at the hæmorrhoidal veins, even to the fainting away of the Spirits or swooning: Besides that sometimes being cast out from the Lungs or Ventricle, gives a suspicion of an Ulcer lying hid, or at least a great debility in the affected part: Wherefore if these bloody excretions are immoderate, or happen in an inconvenient place, they ought for the present to be stopped, and prevented for the time to come.

For the staying of the Blood when it breaks forth immoderately, the method is commonly known, and there is nothing more to be done or particular in this distemper by reason of the Scurvy, than when excited upon other occasions: But as to the preventing Hemorrhagies, Remedies, which take away the acrimony of the

Blood, and bind up the mouths of the Vessels being too loose and gaping, are to be administered, either intention is best performed by Chalybeate Medicines. The use of vitriolick Spaws is very fit in this business, besides the infusions of Steel, Extracts, Salt, and such kind of preparations which chiefly contain the saline or vitriolick nature of the Iron, are always most profitable against Hæmorrhagies: by what means Iron and its preparations, produce these effects and several others in the humane body, we have shown already.

Take of the Conserves of red Roses, of Cynorrhodon or of Hipps each $\mathfrak{z}\text{ij}$, of the species *Diarrhodon Abbatiss*, and *Diarrion Santalon* each $\mathfrak{z}\text{ij}$, of the salt of Steel $\mathfrak{z}\text{j}$, of the best *Crocus martis* prepared $\mathfrak{z}\text{ij}$, of red Coral prepared $\mathfrak{z}\text{ij}$, with what will suffice of the Syrup of Steel, make an Electuary: Let the quantity of a Nutmeg be taken thrice a day, drinking after it a draught of some proper Liquor.

For poor people I am wont to prescribe after this manner, Take of the tops of Cypress, of stinging Nettles each $\mathfrak{z}\text{ij}$, of Brooklime $\mathfrak{z}\text{ij}$, let them be pounded in a Mortar with $\mathfrak{z}\text{x}$ of white Sugar, then add the thin shalings of Iron finely powdered $\mathfrak{z}\text{i}$, of the powder of white and red Sanders each $\mathfrak{z}\text{ij}$, with what will suffice of the Syrup of Nettle juice, make an Electuary: The dose the quantity of a Walnut twice a day.

Take of distilled water, or of a temperate anti-scorbutick Decoction $\mathfrak{f}\text{ij}$, of our Steel prepared $\mathfrak{z}\text{ij}$, mingle it in a glass: The dose from 3 to 4 Ounces.

Take of the tops of stinging Nettles, of Brooklime each $\mathfrak{m}\text{ij}$, being bruised let the juice be pressed forth and kept in a Glass, the dose $\mathfrak{z}\text{ij}$ or $\mathfrak{z}\text{ij}$ twice a day, with distilled anti-scorbutick Water.

Of the Vices of the Mouth coming of the Scurvy.

As soon as the scorbutick Taint seizes on the parts of the Mouth, so that the Gums begin to swell, and their flesh to become spongy, presently Remedies which may drive away putrefaction from them, are carefully to be administered: Among these, things to wash the mouth and liniments are of chief use, whilst the Disease is beginning about these parts, or growing grievous therein, which yet have respect to various intentions, and so are severally to be prepared, viz. the flesh of the Gums at first swelling up, are to be freed and dried from the incursions of the Corrupt and salt Blood or Serum: Afterwards their flesh growing flabby and falling from the Teeth, is to be defended from rottenness, and also that it may more strictly embrace the Teeth, it is to be constrained or bound closer, for these and perhaps other intentions, Gargarisms or waters to wash the mouth of several kinds are instituted: The chief Ingredients of which for the most part are boyled vegetables and infused Minerals. The Herbs or Roots which are boyled in some fit liquor, viz. Water or Wine are most commonly either sharp, bitter, or styptick or binding, and so these sort of Decoctions are impregnated, either with a Volatile, Lixivial, Vitriolated, or Chalybeated, or aluminous Salt, we will here shew you some forms of every kind of them.

1. When therefore the flesh of the Gums begins first to swell up, and to become spongy by reason of the influx of a corrupt and salt Blood and Serum; take the middle bark of the Elder Tree and of the Elm each $\mathfrak{m}\mathfrak{ss}$, of the leaves of Savory, Sage, Hedge-mustard, garden Cresses, each $\mathfrak{m}\mathfrak{j}$, of the roots of Pellitory $\mathfrak{z}\text{ij}$, being bruised and cut let them be boyled in $\mathfrak{f}\text{ij}$ of Lime water, to the consumption of the third part: If a sweetning be required, add of honey of Roses $\mathfrak{z}\text{ii}$, make a Gargal. Or take of Camphorated Vitriol $\mathfrak{z}\text{i}$, (commonly called by our Countrymen by the name of Captain Green's Powder) a quart of Spring water, mingle them in a glass and shake them well together, and then the Liquor settling and growing clear, may be made use of. Or let there be prepared a Lye of the ashes of Broom, or Rosemary, or of Nitre, or Tartar calcined, boyl in 3 pints of this, of the leaves of Savory, Thyme, Sage, Rosemary, each $\mathfrak{m}\mathfrak{j}$, when it is strained put into it two handfuls of Scurvy-grass leaves, make an infusion close and warm for three hours, then let it be strained again, and kept to wash the mouth often in a day.

For the same intention also, Liniments may between whiles, and especially at night be applied, that their virtues may be communicated to those that are sick, or while they are sleeping. There is a prescript very celebrated among Authors, and by

by long use confirmed. Take of the Leaves of Columbine, of curled Mint, Sage, Nutmeg, Mirrh (which sometimes may be omitted) of each $\mathfrak{z}\text{ij}$, of burnt Allum $\mathfrak{z}\beta$, of Virgin Hony $\mathfrak{z}\text{iiij}$, or what will suffice, make a Liniment according to Art.

2. When the Flesh of the Gums growing flaggy, forsakes the Roots of the Teeth, sometimes a light Scarification may be administred, besides let the mouth be washed with this Decoction. Take of the tops of the Bryar, Cypress and Ladysmock Leaves, each $\mathfrak{m}\text{j}$, let them be boyled in three Pints of Water, in which Iron hath been quenched, to the Consumption of the third part, to the straining add of Hony rosat. $\mathfrak{z}\text{ij}$, mingle them.

This kind of Liniment may be applyed. Take of the Pouder of the *Florentine Oris*, of the Leaves of Sage and of St. *John's Wort*, each $\mathfrak{z}\text{ij}$, of bole Armenic, of *Sal Prunella*, each $\mathfrak{z}\text{j}$, of fresh Virgins Hony, as much as will suffice, let them be well incorporated, by working them together.

2. When the Gums begin to putrefy and corrupt, and also the Teeth, and the flesh about them grow loose and yeild a noysom Savour, more strong Medicines and great resisters of Putrefaction are administred, here an infusion of Vitriol Camphorated, also of the Medicinal Stone, have the chief place.

Or take of the Roots of Gentian, and of round Birthwort being cut, each $\mathfrak{z}\beta$, of the Leaves of the lesser Centaury, pontick Wormwood, Savory, Columbine, each $\mathfrak{m}\text{j}$, let them be boyled in Lime water, or a Lie made of either Iron or Alum $\mathfrak{f}\text{iiij}$, to the consumption of the third part. Add to the Colature of raw Hony $\mathfrak{z}\text{ij}$ or ij , mingle them.

4. If the falling out of the Teeth be chiefly feared, take of the Bark of the Roots of the Sloe Tree $\mathfrak{z}\text{j}$, of Tormentil and Bistort whole, each $\mathfrak{m}\text{j}$, of the outer Rinds of Pomegranats, and the Flowers of the same, each $\mathfrak{z}\beta$, let them be boyled in three Pints of Spring Water. Add to it when strained, of Alum 2 or ij drams, of the best Hony $\mathfrak{z}\text{ij}$, mingle them. Take of Vitriol Champhorate, of burnt Harts-horn, each $\mathfrak{z}\text{j}$, of Nutmeggs $\mathfrak{z}\beta$, of the best Hony what will suffice, make a Liniment. Or take of the Pouder of the Root of Bistort, of the Rinds of Pomegranats, of bole Armenick, of burnt Allum, each $\mathfrak{z}\text{j}$, of Hony of Roses what will suffice, add of the Spirit of Vitriol $\mathfrak{z}\text{j}$; make a Liniment.

5. If at any time (as sometimes it is wont) that deep and putrid Ulcers eat into the Gums or other parts of the Mouth, the aforesaid more strong Remedies are often to be used. Besides, let little raggs be often applyed to the affected place, steeped in Egyptian Oyntment dissolved in the Spirit of Wine, or in an Infusion of Sublimate, or of the medicinal Stone. In these cases the Cure is to be left to a skilful Chirurgeon.

Of the Pains that are wont to Infest the Leggs, and sometimes other Limbs, Chiefly in the Night.

Against these Pains, for that indeed they are sometimes very bitter; besides the general method of curing the Scurvy, Specifick Remedies, and things helping this Symptom are ordered. Therefore in such a case, the means of Purgation being instituted, and Phlebotomy also (if there be need) celebrated, it is convenient to set upon the Disease with inward Physick, and outward Topicks.

As to the first, those which move by Sweat and also by Urine, does often avail, for that they carry another way, the lixivial and four recrements of the Blood and nervous Juice, that are wont to be gathered together in the affected part: But chiefly those things are to be administred, which may defend either Humour from its depraved nature, viz. both Saline and Sour: shelly Pouders, Crabs Eys, Jaws of Pikes, also Spirits, and Flowers of *Sal Armoniack*, Spirits of Blood, Tincture of Antimony and of Coral: Decoctions of the Roots and Seeds of Burdocks, *Chamepitys*, Germander, very much help. Which kind of Remedies are to be taken twice or thrice a day with Antiscorbutick distilled Waters. Water distilled out of Horfedung, to which is added Scurvygrass, Brooklime, Gout Ivy, and such like, is sometimes very profitable. In the mean time Liniments, Fomentations, Cataplasms and such kind of Applications which allay Pains, are outwardly to be applyed.

Of the wandering Scorbutick Gout.

Eugalenus, Wierus, the Campen Physitian, and Gregorius Horstius, have writ particularly of this distemper, said to be very frequent in the Northern Countries of Belgia. A certain Sign of which is manifested by putting a live Worm to the grieved place, for he is presently wont to leap off, twine himself about, bend himself round, to slide along, and to dye: which I have also often experimented on our Country men. The reason of which Experiment (as it seems) is this: we have determined the cause of the Pain and Tumour stirred up in the affected part, to be for that the saline or Lixivial Fæculencies from the Blood, and the sour, from the nervous Juice, being deposited in the same place, do mutually ferment or grow hot, even as Spirits of Vitriol and Salt of Tartar, mingled by deliquium or melting: further from such a striving and agitation of dissimilar particles, as the Pain and Tumour are caused, so indeed very sharp, and as it were Corrosive Efluvia's plentifully evaporate, which kill the worm layd upon the grieved place, even as if he should be held over those Liquors boyling: Because of the effect of this Experiment, the cure of this Disease has been ordained by Worms, to wit, Remedies prepared of them; but I know not whether being taken inwardly, they so certainly destroy the Disease, as they being applyed outwardly, are destroyed by the Disease. Even as Worms, so also Snails, Hoglice, or Sows, and other bloodless little animals, for that they abound in a volatile Salt, do often enough become an efficacious remedy.

*Henry Petrus relates two remedies used against this Disease, in Westphalia. Take 9 Worms bruised together, with two spoonfuls of Wine in a Morter, and wrung out hard through a woollen Cloth, to these add half a measure of Wine, and let it be taken 3 spoonfuls morning, noon and night, for several days. 2. Take two or three spriggs of Savin, two spoonfuls of Virgins Hony, let them be boyled in a measure of Wine, till two fingers breadth be wasted: let it be strained, and take of it 4 or 5 spoonfuls thrice in a day. A certain Vulgar Potion, a kin to the former Medicine, is cited by *Horstius*, and called the Monasterie Potion: Take of Sage Betony, Rue, of each 5 Leaves, of earth Worms, every one with red rings about their Necks, number 5, a little Savin, of Devils bit Roots 2, let them be bruised with Water of Elder Flowers, and the Juice being pressed forth, let it be given to move Sweat. Also the like prescript is proposed by the *Campen Physitian in Forestus*.*

Certainly in this distemper the Magisterial Water of Earthworms, prescribed in the London Dispensatory, is extreamly convenient. I have often given also with good success, the Spirits and Salts of Harts horn, the Spirit of Blood, and the Flowers of *Sal Armoniack*. Besides the shelly Pouders, as of Crabs Eyes, Corals, Perls, and Vegetables, which have in them Antidotes for the Gout, as the Roots of Birthwort, the Leaves of Groundpine, Germander, and the like joyned with Antiscorbuticks, conduce to the cure of this Disease. Outwardly, for the allaying of the Pains, besides Anodynes, things under the form of a Liniment, Fomentation, or Cataplasin, are made use of: The Oyl of Earth-worms, Froggs, and Toads, are often very profitable. I was told by a very signal Person much obnoxious to this Disease, that the Water of the Contents, taken from the Ventricle of an Ox newly killed, and drawn off clear by distillation, and with Raggs dipt in it warm, and applied for a Fomentation, brings certain help.

Of the Convulsive and Paralytick Distempers that are wont to come upon the Scurvy.

When at any time the scorbutick Taint breaking in upon the Brain and Nervous Stock, doth greatly infect the moistning Liquor of either Province, for that reason indeed, several Diseases, and chiefly the paralytick and Spasmodick, or cramplike distempers (as we have already shown) are wont to arise: even according as the morbidick matter, being carried to the Animal Kingdom, shall be either narcotick or explosive. Although these kinds of Distempers shall be accounted in this

this case Symptomatical, yet they being very grievous, do challenge for themselves both the name and the greater part of the Cure, before their parent the Scurvy; so that the Sick is said rather to labour with the Palsy, or the Convulsion, then with the Scurvy, and also Medicines proper for those distempers, are at the same time proposed, with the others requisite to other Intentions.

For the curing those Distempers coming upon the Scurvy, that chiefly must be performed, that the Remedies appropriate to them be rightly or conveniently applied with Antiscorbuticks. As to the Convulsive Diseases, what I have made known in a former tract, may be easily transferred hither. But as to the Palsy, Lethargy, and many other distempers of the Brain, and nervous Stock we intend shortly to make publique some special Disquisitions thereupon: In the mean time it is not fit, that we should in this place forestall the therapeutick Method, which belongs to those discourses, but rather we will propose what may seem necessary at the end of this Work, the Cases and Cures of some scorbutick Persons, lying sick also of those Diseases.

Of the Atrophy or wasting of the Flesh: also of the Scorbutick Fever; which oftentimes is either the Cause of it, or the accident, or effect of it.

There are three kinds of Causes, hanging by a certain Series, from one of which or more the scorbutick Atrophy without the Consumption of the Lungs is wont to be produced, viz. either the Chyle is perverted by the default of the first passages, by which means it does not carry sufficient or laudable provision to the Blood. Secondly, or being brought to it, yet by the fault of the Blood, it is not rightly changed into Blood and nutritious Juice. Or thirdly and lastly, the nutritious Juice being prepared in the bloody Mass, by reason of the fault of the nervous Liquor, is not rightly assimilated in the solid parts.

The Remedies appropriate to this Symptome respect either the emendation of the first passages, or of the aforesaid Humors. As to the first, sometimes it happens by reason of the Tone of the Stomach being broken, or its Ferment vitiated, so that it comes to pass that the aliments put therein are not rightly dressed, but turn into an unprofitable Rottenness. To these sort of evils, gentle Catharticks, digestives and strengtheners are to be administered. But more often the work of Chylification or of making the Chyle, is hindered by reason of a Schirous Tumour, being excited now in the Ventricle, now in the Mesentery or in the circumjacent part. In this case opening and dissolving things are convenient; and the use of Spaws or Purging Waters has bore away the Bell from all other remedies: Besides Fomentations, Liniments, or Plasters, ought to be outwardly applied.

Further, it sometimes happens that without any Tumor stirred up in the Viscera, the milkie Vessels being impacted by some thick and viscous Matter, to be so much obstructed, that the Provision of Chyle, though laudable enough and plentifully made, is not sufficiently carried into the Blood. In this distemper, for the most part the Belly voides copiously white excrements like curdled Milk, and not like others dyed or stinking with Choler. The reason of which is, for that the impoverished Blood more sparingly begets the yellow bile, from which being poured into the Intestines, the colour and stink of the Excrements proceed. In this case the purging Spaws are convenient, and also with things opening, taken inwardly, Liniments, Fomentations, and Baths are used outwardly.

Against the *Marasmus* or wasting of the Flesh, arising from the fault of the Blood, degenerating from its Complexion, Asses or Cows Milk diluted with Water, or other proper Water distilled, often brings help. The broth of Snails or milk Meats, with them boyled in them; besides distilled waters of Milk or Whey, with Snails and temperate antiscorbutick Herbs mixed, help very much in this Case: also to this end, decoctions with Vulnerary and antiscorbutick Herbs infused therein are taken with good success: In the mean time Frictions to the external parts, with woollen coathes made warm and dipped in resumptive Oyntment, or the fresh Oyl of Walnuts, may be dayly administered.

When the Atrophy arises from the Vice of the distempered Blood, perverting
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by that means the nutritious Juice, it hath most commonly joyned with it, an erratick Fever with nightly sweats, for that the sanguinous Mass is compelled to unequal and uncertain effervencies by that degenerate Juice; and that the so troublesome matter is cast out by the nightly Sweat. In this case a slender Diet being ordered, let them often take Decoctions and distilled waters, which fuse and purifie the Blood, with anti-scorbuticks mixed therewith.

Take of the shavings of Ivory and of Hartshorn each $\mathfrak{z}\text{ij}\mathfrak{s}$, of *Eringo* Roots preserved $\mathfrak{z}\text{vj}$, of the Roots of Chervil, Dandelyon, each $\mathfrak{z}\mathfrak{s}$, of the leaves of Harts Tongue and Liverwort each $\mathfrak{m}\text{ j}$, one Apple cut, of Raisins of the Sun $\mathfrak{m}\text{ j}$, let them be boyled in Spring water $\mathfrak{fb}\text{iiij}$, to the consumption of the third part: Being strained, put into it of the leaves of Brooklime bruised $\mathfrak{m}\text{ ij}$, of *Sal Prunella* $\mathfrak{z}\text{ij}\mathfrak{s}$, or of fixed Nitre $\mathfrak{z}\text{ j}$, make an infusion warm and close for 3 hours: Take of it iiij or $\mathfrak{z}\text{vj}$ thrice in a day.

Take of the leaves of Brooklime $\mathfrak{fb}\text{iiij}$, of Sorrel and Dandelyon whole each $\mathfrak{m}\text{ ij}$, of Snails cleansed $\mathfrak{fb}\text{ij}$, the rinds of two Oranges: Being sliced, cut, and beaten, pour to them of sweet Milk or Whey made with Cyder, or of the Juice of fresh Apples $\mathfrak{fb}\text{vj}$, let them be distilled after the ordinary way, take of it $\mathfrak{z}\text{ij}$ twice or thrice in a day.

Of a Rheumatism.

This Distemper we have determined to proceed from the congression and mutual effervencies of the Salts which are of a divers nature and generation, to wit, of the fixed coming from the Blood, and the acetous coming from the nervous Juice. The subjects of either Salts are the superfluous feculencies deposited, and by the aforesaid humours acted into certain turgescencies or risings up, being spread abroad into the parts, now into these now into those: Wherefore that the Disease may be cured, and the turgescencies of the humors allayed, both their superfluous feculencies are to be purged forth, and also both the degenerate Salts of either order, are to be reduced and made volatile.

For the two former intentions, a light Purge, and Phlebotomy are chiefly required, and ought to be often repeated according to the strength of the Patient; also Diureticks and Diaphoreticks which may convey forth some way the salt Serosities, are next to be given: That these sort of Evacuations may the better succeed leisurely, with a good habit and nature assisting, Opiates are often made use of: For the other scope on which the chief hinge of the cure doth turn, alteratives, and chiefly those which are indued with a volatile Salt, do greatly help: Wherefore in this case it is a common, but not to be contemned Medicine, to drink twice or thrice a day 4 or 6 ounces of an Infusion made of Storie-horse dung, in small Wine or Ale or in proper distilled water. But a Medicine a little more grateful, though not more efficacious may be prepared, if a water be distilled out of that Dung with anti-scorbutick Ingredients, infused in Whitewine or Cyder; which may be taken twice in a day from $\mathfrak{z}\text{ij}$ to $\mathfrak{z}\text{iiij}$, I have often prescribed in this case Spirit of Hartshorn, and of Blood, with very signal benefit to the sick.

Of the Dropsie.

As we have determined that the Dropsie that is wont to succeed upon the Scurvy, is two fold, viz. habitual and occasional, we should utterly lose our labour to speak of the cure of the former, for in truth no Remedies can be able to restore the Liver and the Lungs, and the other *Viscera* sometimes vitiated, and the complexion of the Blood wholly overthrown. In such a case if any thing be thought fit to be done, the bounds of Medicine will be but narrow, for neither for Catharticks nor Diaphoreticks, nor for any other more strong sort of Evacuation, is there any place left: Therefore chiefly and indeed only Cordials and Diureticks must be insisted on. To these ends, *Elixirs*, *Tinctures*, *Electuaries*, *Powders*, *Infusions*, *Decoctions*, *distilled Waters*, &c. which are partly against the Dropsie and partly against the Scurvy, are to be administred; but because they signifie little we shall omit prescribing their forms.

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The feorbutical Dropsie suddenly excited from an evident or certain occasion, as hath been shown, very often admits of a Cure, which that it might more easily succeed, first of all the tumults of Nature are to be quieted, and its inordinations to be suppressed: Wherefore if awaking do very much infest, Sleep must be allured by the use of Opiates, and then it must be provoked as often as there is great need. As soon, as by reason of strength, it may be lawful to purge, let the following Pouder be taken, and a due space being between let it be repeated, and in the interim let the Belly be kept soluble by frequent Clysters. Take of *Mercurius Dulcis* ℥j, of the refine of Jalap gr. v to 10, of Cloves ℥ss, mingle it, and let it be given in a spoonful of Watergrewel; at other times Diureticks, and sometimes Diaphoreticks are carefully to be taken. Take of the tincture of the salt of Tartar, impregnated with an infusion of *Millepedes* or Hog lice as much as you will, let there be taken of it ℥j to ℥ij twice in a day, with an appropriate Liquor.

Take of the Spirit of *Sal Armoniac* what you will, the dose ℥ss to 15 drops, after the same manner. Take of *Millepedes* prepared ℥ij, of the Salt of Tartar ℥ij, of Nutmegs ℥j, mingle them and make a Pouder: The dose 3ss twice in a day with a proper Liquor. Or take of Bees dried and powdered ℥ij, of the pouder of Ameos Seeds ℥i, of the oyl of Juniper ℥j, of Turpentine what will suffice, make a Mass of Pills: The dose ℥j to 3ss twice a day, drinking after it a specifick Liquor.

Take of the leaves of either Scurvygrafs, of water Cresses, Pepper wort, Arse-smart, each m ij, of the Roots of Aron, Briony, of the Florentine Oris each ℥iiij, of the middle Bark of the Elder Tree m ij, of Winteran's Bark ℥ij, the outward rinds of 4 Oranges and of 3 Limons, of new Juniper Berries ℥iiij, being cut and bruised, put to it of Rhenish Wine 3 pints, of Wine of the Juice of Elder Berries lbij, let them be distilled after the ordinary way, and let all the water be mixed together. Dose ℥ij to ℥iiij twice in a day; after a dose of any of the Medicines prescribed before.

Let there be prepared Decoctions and medicated Ale, such as hath been before described, adding thereto anti-dropsical Ingredients.

Of the Crackling of the Bones.

There yet remains a symptom sometimes, though rarely coming upon the Scurvy, viz. a crackling of the Bones, the cure and reason of which being omitted in the former Pathology, it will not be amiss to speak of it here. I have known some, but not above three or four, who whilst they laboured with the Scurvy were troubled with its evil, not only in the humours and fleshy parts, but at last also in the Bones themselves, for as often as they bended any of their Members any way, the heads of the Bones as if they were naked, rubbing against one another made a great noise: Further, as they lay in bed and turned themselves from one side to the other, a great noise from the collision of the *Vertebra*, as if it were the shaking of a skeleton, was plainly heard, even affrighting those so affected.

The Conjoint Cause of this perhaps may seem to be, that the soft *interstitium* of the Bones, viz. the Fat, Membranes, and Ligaments, being greatly wasted, their junctures even as millstones, being altogether emptied by reason of their mutual rubbing together, make a noise: But the matter is quite otherwise, because those that are greatly wasted away have not this crackling noise of the Bones, nor do those who labour with this Distemper always waste off their flesh: Wherefore we rather say that the immediate cause of this symptom, is the dryness of the Bones or a defect of the *medulla* or marrow so properly called, which ought to be contained within the cavities of the Bones, and chiefly within their heads: For as certain Bones do include marrow or an unctuous humour every where shaken out, either from the great cavities or pores, and the small passages, we have determined the use of this to be, that both the Bones being thus moistned, may become less brittle, and moreover, that this humour moistning the knobs of the Bones, may make slippery all the joyntings, even as Grease or Oyl the hinges of a Machine, and by that means facilitates their motion: Wherefore the heads of the Bones being destitute of this marrow, make a noise like to the wheel of a Cart that is seldom greas'd.

But if the proctartick or more remote cause be inquired into, viz. wherefore that

that unctuous liniment of the Joynts becomes defective; this indeed is to be imputed either to the vice of the Blood, as if it did not supply the Bones with aliment, participating equally with Sulphur and Salt, which truly seems unlikely, because the bloudy Mass also in scorbutical persons, contains Particles of either of the aforesaid kinds, and for that these labouring with the crackling of the Bones, have their Skin and Muscles sufficiently moistned with fatness: Or secondly and more likely, this unctuous humor by which the Joyntings are made slippery is wanting, through the fault of the Bones themselves, *viz.* because their pores and passages being so much obstructed by some extraneous, and perhaps muddy matter, or tartareous carried thither by the Blood, that for that reason they cannot receive sufficiently the Balsom destinated for them, nor send it forth for the moistning their Joyntings: It will not be easie (for that the matter lies so abstruse) to investigate the particular reasons of this Distemper, nor to conjecture further in this *Ætiology*.

We are no less at a loss, how to proceed in the cure of this Disease: For although the primaay indication, *viz.* the humectation of the Bones or Joyntings is obvious enough, yet by what means and by what Remedies that should be performed, does not so plainly appear. For I have known in this case very many kinds of Medicines, and several ways of Administrations tryed altogether in vain. A certain ingenious man, labouring for many years with this Disease, had taken the advice of many, and of the most famous Physicians, and besides the usual Remedies against the Scurvy, (together with often letting Blood and purgations, from which he received no help) he tryed various and long courses of Physick without any success: for after he had underwent a method prescribed by one Physician for some months in vain, he applyed himself to another and so again to more. In the mean time, from each of them was prescribed always a new way of curing, unessayed by the former: Fomentations, Liniments, and Frictions are daily applyed to the Joynts, and sometimes the Baths at Bath were used, and then several sorts of purging waters, sometimes one sometimes another were drunk; all which nothing helping out, a chalybeate course was taken, and another time a decoction of the more temperate woods, sometime a Milk Diet, and again at another time Electuaries, distilled waters, *Apozems*, and other Remedies prepared against the Scurvy. After this manner when he had lived almost constantly medically and miserably above three years, and nothing profited as to the Cure of the aforesaid Disease, but in the mean time he was indifferently well as to his strength and Stomach, he married, and as to the rest of the common Symptoms of the Scurvy became better: Hence it appears too pertinacious a Disease, yielding almost to no Remedies, the crackling of the Bones is, which I have also proved in others, labouring with the same Distemper altogether mocking and eluding the skill and pains of the Physician.

CHAP. X.

Of the Vital Indication, in which are included Cardiack Medicines, Opiates, and Diet, or the manner of living as to Eating or Drinking, requisite in the Scurvy.

WE have hitherto largely unfolded the Indications both Preservatory and Curatory, which belong to the Cure of the Scurvy, it yet remains that we speak of the vital Indication, to wit, that we may declare by what method and by what Remedies, the strength of the sick being too apt to languish, may be sustained, or being lost and cast down may be restored. For these ends, Cordials and Opiates are prescribed to be taken, according to the exigencies of the sick, and besides a right way of living as to Diet, and if need be an analeptick or restorative, and always anti-scorbutick is prescribed.

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As to Cardiack Medicines, to wit, which thorowly agitate the Blood, stagnating in the heart, refuscitate or raise up its half spent flame, restore the animal Spirits oppressed or distracted to a free and due irradiation, it is obvious that very many Remedies which properly are called Anti-scorbuticks, do perform these intentions, of which sort are the compound water of Radishes, the magisterial of Snails and Earthworms, the Spirits of Hartshorn and Soot, the shelly Pouders with many others, which are not only taken with benefit at certain hours, according to a method ordained in a certain order, but also as occasion shall serve when ever a *syncope* or fainting of the Spirits shall happen.

But besides those who are found very obnoxious to passions of the Heart, frequent Swoonings, Nauseousness, Vomiting, Tremblings, *Vertigo's*, and other horrid Symptoms, have also ready other sorts of Medicines, more properly Cordials, by which they give relief immediately to their fainting Spirits. To this end is very convenient the *Elixir Vita* of the greater composition, in the distillation of the same *Elixir*, the second water may be given to a spoonful sweetned, also the Bezoartick Water, *Aqua mirabilis*, *Gilbert's* temperate water, Treacle and Cinnamon water, to each of which compounded or of themselves, may be added *Confectio Alchermes*, *Confectio de Hyacintho*, powder of Pearls or the magistery of Coral, Syrup of Clove Gillyflowers, of Coral, of Citron peels, or of Cinnamon: Of these and others of this Rank, divers forms of Medicines are wont to be prescribed, as for Example.

Take of Treacle water and *Aqua mirabilis* each $\mathfrak{z}\text{ij}$, of Balm water $\mathfrak{z}\text{iiij}$, of the Syrup of Clovegillyflowers $\mathfrak{z}\text{ij}$, of the Confection of *Alchermes* $\mathfrak{z}\text{j}$, mingle them: The dose \mathfrak{z} or $\mathfrak{4}$ Spoonfuls.

Or take of *Aqua mirabilis* $\mathfrak{z}\text{vj}$, of Snails and of Walnuts each $\mathfrak{z}\text{ij}$, of the Powder of Pearls $\mathfrak{z}\text{j}$, Confection de *Hyacinth*. $\mathfrak{z}\text{j}$, of the Syrup of Clovegillyflowers $\mathfrak{z}\text{j}$, mingle them.

When scorbutical Women are wont to be troubled with hysterical Distempers, or Men with Convulsive; take of Balm and Pennyroyal water each $\mathfrak{z}\text{ij}$, the compound water of Briony $\mathfrak{z}\text{iiij}$, of the tincture of *Castor* $\mathfrak{z}\text{ij}$, of the tincture of Saffron $\mathfrak{z}\text{j}$, of the Syrup of Clovegillyflowers $\mathfrak{z}\text{ij}$, of *Castor* tyed in a rag and hung in the glass $\mathfrak{z}\text{j}$, the dose is \mathfrak{z} or $\mathfrak{4}$ spoonfuls.

For those who had rather have Cordials in a solid form, Electuaries or Tablets are prescribed.

Take of the Conserves of Clovegillyflowers $\mathfrak{z}\text{ij}$, of the Confection of *Alchermes* $\mathfrak{z}\text{ij}$, of the powder of Pearl \mathfrak{z} , with as much as will suffice of the Syrup of Coral, make an Electuary.

Take of the species of *Diamargarit. frigid.* of *Diarrhodon Abbatis* each $\mathfrak{z}\text{ij}$, of Pearls powdered, of the best Sugar dissolved in Treacle water, and boyled up to Tablets $\mathfrak{z}\text{iiij}$, of the oyl of Cinnamon 6 drops, make Tablets according to Art.

As to what relates to Opiates and anodyne Medicines, in some distempers of Scorbuticks, I had rather want the use of any other kind of Medicines besides than of these, for indeed I have found by often experience, that there is no better Remedy, not only against pertinacious pains and wakings, but in asthmatical paroxysms, in Vomiting, Fluxes, and also in the *Vertigo*, and in the Convulsive Distempers, as often as nature being irritated or provoked above measure, hath fallen into most cruel inordinations, than that Sleep might be allured by some safe Narcotick being given: In the mean time there is need of caution, that they be not taken when there is any thing in the constitution of the Sick, or in the condition or time of the Disease, that may forbid the exhibition of such a Medicine.

Besides the hypnoticks usual in the Apothecaries Shops, viz. Opiate, *Laudanum*, *Nepenthe*, *Philonium*, *Diacodium*, and Syrup of wild Poppies, I know two preparations of *Opium*, which I am wont to give in the form of a Tincture or more liquid extract, with any other appropriate Liquor from 10 to 20 drops.

Diet or the manner of living, to be observed by Scorbuticks in the curatory method, is not of the least moment, which being neglected or ill instituted, the other prescripts of Medicine profit very little or nothing towards health: As the diæteticke Rule extends it self to various things, yet chiefly it is imployed about the Air, the foyl of the habitation, Meat and Drink, and the motion and rest of the Body.

As to the first, what kind of places and mansions in respect of the Heaven and Soil, do breed the Scurvy, and therefore ought to be avoided, appears sufficiently

by what we have above declared. Those who studie to prevent or to cure this Disease, let them endeavour to chose an Aire moderately hot and dry, and which shall be also thin and pure and sufficiently eventilated or winnowed.

Meats only for good Juice and well cooked are convenient; heavy, slimy, putrefied, fennewed and meats dryed in the Smoak, also unfermented aliments, or greatly compounded, Pulse, Milkmeats, and unripe Fruits are to be shunned, Sweatmeats or things candied, or very much imbued with Sugar, I so much blame, that I am apt to think the Invention and immoderate use of them, to have contributed very much to the cruel increafe of the Scurvy in this Age. For indeed that Concreet is made up of a Salt sufficiently sharp and Corrosive, though mitigated with Sulphur, as may plainly appear by a Spagyricall *Analysis* made of it. For Sugar (as we intimated before) being distilled by it self, yields a liquor, little inferior to the Stygian Water: for if you shall distil it, being poured to a good deal of spring Water in a Bladder, although the fixed Salt does not so ascend, yet it produces a Liquor like to the sharpest *Aqua vita*, burning and highly pricking: Therefore as Sugar being commixed almost with every aliment, is so plentifully taken in by use, it is very likely that from its daily use, the Blood and the Humours are rendered salt and sharp, and from thence Scorbutick. A very famous Author hath attributed the cause of the English Phthisick, or Consumption, to the immoderate use of Sugar among our country men, and I know no reason, but that I may rather think the increafe of the Scurvy derives it self from this enkindling.

Let the Drink be midling Beer, mild and clear, and altered with antiscorbutick Ingredients, but without any ingrateful taste; let it not be thick nor sweet, nor too salt and sour, and let it be taken in a moderate quantity, and almost only at the set times of Dinner and Supper: That which with many is thought a good Custom, to wit, that as soon as they are out of their beds, to indulge themselves with (as they usually say) a large mornings draught, seems to be very pernicious. For by this means, for that the sanguiferous Vessels are too much filled with the provision of fresh Chyle, almost perpetually poured in, both Crudities and morbid Fæculencies are begotten in the Blood, and the office of Sanguification greatly weakened. It is better indeed for most men (unless such, who whilst they are empty and used to have their Ventricle grievously wrinkled and drawn together) to remain fasting till dinner, nor is it a less adversary to health, according to the usual custom, to fill themselves with drinking full Cups presently after Dinner. Wines or Cyder so they be mild, right and not adulterated, and moderately taken, do not hurt; but there is nothing more hurtful and injurious to our health, than those adulterated, ropie, sharp and growing sour.

Exercise and Labour is so very profitable, both for the curing and the preventing of the Scurvy, that many by this remedy only have recovered their Health, or preserved it intire: For in those leading an idle and sedentary Life, the Blood and nervous Liquor like standing Water contract a slimyness and muddy settlement: But by much and assiduous motion of the Body, the Humours and the Spirits grow clear and vigorous, the excrementitious and heterogeneous Particles evaporate, the stuffings of the *Viscera* are discharged and their tone strengthened.

CHAP. XI.

Some Histories and rare Cases of Scorbuticks.

Observation.

VWhat we have thus delivered, concerning the Theory and the Cure of the Scurvy, shall be yet illustrated more clearly by examples of sickness, or by Histories brought to light and explained according to the aforesaid *Hypothesis*. As there are manifold and divers cases extant of those labouring with this Disease, we shall here propose some more rare, excited by reason of the Taint being affixed in the Brain and nervous Stock, no less than in the Blood.

A Gentlewoman, tall and handsome, about 25 years of age, had contracted the scorbutick Taint by reason of various errors in living, or manner of life, the signs of which were a spontaneous weariness, difficult breathing, pains and spots in her Legs, besides her Gums swollen and bloody; in the spring time after miscarriage falling into a tertian Feavour, suddenly she became languishing and weak, from which disease, however she had been quickly recovered, being at first methodically cured, but that greedy of flesh and other incongruous things, she soon fell into a Relapse. But then growing weary of Medicine, she took only empirical Remedies, by which sometimes her Ague fits were driven away, then soon after they returned: In the mean time she remained pale, weak as to motion, breathing short and swollen, and blown up near the Ventricle and *Hypochondria*. About the third month of her sickness she began to feel cruel Pains and Torments in her Belly; which afflicted her almost continually night and day, running about, now at her Back, now in her Stomach; Besides she was affected sometimes with hysterical Fits, and with a frequent Vertigo, also being troubled with often Vomiting, she daily cast forth a clammy and frothy Flegme. Within a months space this Disease displaying its ends, stirred up Pains in the Back, Loyns and then in every part of the Body. But at this time she complained of a great straitness of her Breast, and a great contraction of the *Viscera*. In the mean time the habit of her Body became very lean, that the Bones being destitute of flesh, the Skin could hardly stick on them. Her Urine was little and red, on whose Superficies was a little Skin coloured like the tail of a Peacock. A little time after this, she felt a stupor or numbness and a sense of pricking, sometimes in her Belly, and sometimes in her Limbs, and then the Pains and Torments began to be remitted, but in their place a Pallie succeeded, which within the space of a week so invaded the Members of her whole Body, that she could neither bend her hand or foot or any other part, nor move one jot from the place.

Asto the *Ætiology* or the reason of the aforesaid case, this is plain that these more grievous Symptoms did wholly spring from a scorbutick Root; for by reason of the Taint being fixed chiefly in the Blood, the spontaneous weariness, the difficult breathing, and also the intermitting Fever wavering and often returning, and other previous and as it were more light Skirmishes of Symptoms were induced: further, the lixivial Urine and of variety of Colours, plainly indicated or shewed, a Blood corrupted with a sulphureous Saline dyscrasie or evil complexion: which kind of Piss by that means well known, I have taken notice of in several others affected with the like Disease. But when the morbid Seed in this sick Gentlewoman, being plentifully increased, and flowing thorow the Mass of Blood, did spread into the confines of the Brain and nervous Stock, the more grievous distempers did then arise; to wit, the morbifick Matter, consisting of heterogeneous and irritative Particles, being deposited within the Brain, brought in the *Vertigo* and Swimming, or turning round, and the spasmodick or cramplike Disposition; then a Portion of it falling upon the Nerves of the intercostal and moving Pair, and being by their passages cast upon the mesenterick Foldings, stirred up the scorbutick Colick; and when the same matter being hugely increased, had come to many other Nerves, the painful Distempers were propagated almost into every part of the Body; for that the acid Recrements like to vitriolick *Stagmas*, being deposited every where from the nervous Liquor, did incounter with the lixivial Salts, every where also poured forth from the Blood: Then lastly when all the Nerves being by degrees filled and stuffed with the morbifick Matter, were so much obstructed that the irradiation of the Spirits and their commerce were hindered, the Pallie followed upon the whole Body.

This Gentlewoman living far from hence, had taken Medicines by the advice of a neighbour Physician, usual against the distemper of the Colick; notwithstanding which, when the Disease grew grievous, the Patient being brought to *Oxford*, made tryal of very many Remedies, both Antiscorbutick and Antiparalytick almost of every kind and form, but without any benefit. Therefore after that every ordinary method of Curing, seemed not sufficient for this Disease, it was thought good to proceed to great Remedies, and indeed not altogether free from danger: wherefore we administered to her, as sick, weak and lean as she was, a mercurial Medicine for salivation. The effect of which succeeded to wish, for the Flux at the mouth being risen within two days,

days, and persisting gently for many days without any evil Symptom, brought great ease to this Gentlewoman. For the Pains being mitigated, she began to move a little her Members, and to desire and to digest better her Food, and also to enjoy quiet Sleep. The Salivation being finished, she took a Decoction of Sarsa and China with Antiparalytick ingredients for a few days; then being carried to the Bath, she there used for some time the more gentle and temperate Baths, and presently recovered an indifferent state of Health. All the Winter, she constantly took Medicines against the Scurvy and the Palsy, and when the following year, she repeated the use of the Baths, she grew perfectly well, and afterwards became the joyful Mother of several Children.

Observation.

A Man about 40, of a Melancholy temper, labouring for many years with the Scurvy, was wont to be sensible of divers and manifold Symptoms of it, at several times of the year. There appeared about his Thighs Spots and black large marks as if coming of strokes; pains of the Belly, with a Looseness often troubled him; his Urine for the most part appeared like Lye, and he almost constantly had a spontaneous weariness, a failure of his strength, and a want of Appetite: Besides these ordinary evils, and as it were customary, he lived obnoxious to most cruel Fits of Sickness, and those of various kinds. Two years before when I first saw him, he complained most grievously of a difficulty in Breathing, as if he were in danger to be choaked, with a trembling of the Heart, with a fainting of the Spirits, and of a constant fear of Swooning: Besides if any of these distempers in the *Præcordia* ceased a little, for the most part an heavy giddiness in the head, and *Vertigo* assailed him. After that he had taken for some time Antispasmodick and Antiscorbutick Remedies mixed together, he seemed to be perfectly well; but then within a few weeks he was affected with a nausea and pain about the Heart, with an inflation of the *Hypochondria*; his Urine was little and very lixivial, and shortly after the *Abdomen* swelled up, and then his Feet and Legs with a great watery swelling, shewed the signs of a growing Dropsy: afterwards the same Tumour invaded the flesh of his Thighs, Arms, and Back also: which Distemper however though it seemed desperate, was easily cured with antiscorbutick Remedies, with the addition of Catharticks and Diureticks. But yet this remarkable person, although he was restored to health, did not continue so long: for two quarters of the year were scarcely past but he began to complain of a grievous Head-ach, with a *Vertigo* and a pertinacious waking, and then without any evident cause, he was taken with most horrid Vomiting: a little while after, his asthmatical fits, with the trembling of his Heart and sinking down of his Spirits, returned. Also at this time, when he almost seemed desperate, he again grew well in a little while, with the use of antiscorbutick Medicines. It plainly appears by this case, how many evils the scorbutick infection, like to Ferment lying hid both in the Blood and nervous Juice, and as occasion serves, spreading abroad its Poyson, can cause; which kind of distempers, how horrid and terrible soever they seem, whilst they depend only of the Humors vitiated in their Complexion, and that the *Viscera* are not at all hurt in their Tone or Conformation, are wont to be cured most commonly very easily, or without much trouble, viz. with an antiscorbutick Method aptly designed, both according to the condition of the Patient, and of the Disease.

Observation.

A Lady about 25 years of Age, of a sanguine Complexion, of a slender make of Body, of a fair skin and beautiful, had laboured for some time with the scorbutick distemper; for besides broad spots and red swellings breaking forth in divers parts of her body, she was wont to be troubled of a long time with cruel pains and torments, chiefly vexing her at nights, sometimes in her Legs and sometimes in her Arms: She had often begun to take Physick for the Cure, but being with Child was forced to give it over. After her last Child, for that she had great fluxes, she remained for many days languishing and weak, with difficulty of breathing, and upon any motion breathless. Being risen up after lying in her month, and endeavouring to walk she fell into a most grievous *dyspnœa* or shortness of breath, with the trembling of the heart and a frequent fainting or sinking of the Spirits: Being presently put to Bed, yet trembling and with quick palpitations, she continued so for almost a whole day; besides her lower Members as if they had been dead, were altogether stiff and cold, and could not be made warm with the applications of warm cloaths or by rubbing: At length the night being almost past, she found her self better about her *Præcordia*, strong Cordials having been often administered to her, but there succeeded

ed a very acute pain on the top of her Thigh nigh to her left Groin, reaching even down to the Calf or her Leg, and within a few hours a hard tumor resisting the touch, possessed all that space. Being sent for at this time whilst the sick was gaping for breath, a Clyster being prescribed and taken, I gave her 12 drops of the Spirit of Hartshorn, in a spoonful of the following Julap, $\mathfrak{z}\text{ij}$ of the same being drunk afterwards. Take of the water of Snails $\mathfrak{z}\text{vj}$, of hysterical water $\mathfrak{z}\text{iiij}$, of Walnuts simple and of Pennyroyal each $\mathfrak{z}\text{ij}$, of Sugar $\mathfrak{z}\text{j}$, of Castor tyed in a Rag and hung in the Glas $\mathfrak{z}\text{j}$. These Medicines were repeated every sixth hour. I took care to have a large Vesicatory to be applied to the inward part of her Thigh, then in the evening for that she had continued all this fit without any sleep, I gave her \mathfrak{j} grain of *Laudanum*, of the powder of Pearls vj gr. of the Confection of *Alchermes* without Musk $\mathfrak{z}\mathfrak{ss}$: She slept quietly, and in the morning was very much refreshed, the pain and tumour of her Thigh were somewhat abated, also while she lay quiet in her bed she was well at her *Præcordia*, but if she sat up or turned of one side, she presently seemed as if she would expire with the *dyspnœa* or want of breath. She continued to repeat the use of the Hartshorn and Julap every sixth hour for some days; but because she was oppressed with a troublesome thirst, and that her Urine was little and the Contents red and high coloured, she took a dose to $\mathfrak{z}\text{vj}$ twice a day of the following *Apozem.* Take of Grass Roots, Chervil, *Eringo's* preserv'd, each $\mathfrak{z}\text{vj}$, of the shavings of Ivory and of Hartshorn each $\mathfrak{z}\text{ij}$, of Hartshorn burnt $\mathfrak{z}\mathfrak{ss}$, of Raisins of the Sun $\mathfrak{z}\text{ij}$, 1 cut Apple, of Liquorish $\mathfrak{z}\mathfrak{ijss}$, being cut and bruised let them be boyled in 3 pints of Spring water, to the consumption of the third part; then add of Whitewine $\mathfrak{z}\mathfrak{iiij}$, let it be strained into a Jugg, to which put of the leaves of Scurvygrass and of Brooklime each m. j. , of the Salt of Wormwood $\mathfrak{z}\text{ij}$, make an Infusion close shut and warm for 3 hours, being strained let it be kept in close Vessels: Sometimes every day, sometimes every other day they gave her Clysters. By the daily use of these she seemed to be better, so that within the space of a Week she was able, being raised from her bed, to sit up in a Chair by the fire side for 2 or 3 hours: But if she sat up a little too long, or did but endeavour to stir, she presently fell into an asthmatical fit or *dyspnœa*; so that one day having stayed somewhat longer out of her Bed, having suffered a most heavy assault of the Disease, she was afflicted with a difficulty of Respiration, with a trembling of her whole Body, and continual sinking of her Spirits: By reason of this Relapse of the sick Lady, at last I being sent for, gave her 20 drops of the Spirit of Hartshorn with the above prescribed Julap, and at night a dose of our *Laudanum*; but when she began to be better about her *Præcordia*, the pains and tumors succeeded in her right Thigh and Leg as had happened before in her left: I also ordered a Vesicatory to be applied to that Thigh, and besides the Remedies hitherto cited, she took twice a day of our Wine of the Juice of Scurvygrass $\mathfrak{z}\mathfrak{iiij}$, with $\mathfrak{z}\text{ij}$ of the magisterial antiscorbutick water. Besides I ordered a Purge of our solutive Syrup above prescribed, which succeeded so well, that I repeated it again within 3 or 4 days. With these Remedies she grew well within a Month.

As to the Reasons of the Symptoms observed in the aforesaid case, first it is obvious from the spots and pains of the Limbs, that the Blood and nervous Juice had been for a good while touched with the scorbutick taint, which notwithstanding lay hid within the aforesaid humours, as it were subjugated and without any signal evil, so long as they were strong in the vital and Animal Spirits: But after the great hæmorrhage or flux of Blood, when the Blood and nervous Liquor grew weak in their *Crasis* or Complexion, the particles of the morbid seed like to ferment, being moved, stirred up those terrible distempers: That grievous *Dyspnœa* or want of breath, seemed to arise from a double cause, or a concurrence of a double evil, to wit, because certain pneumonick Nerves being beset with the scorbutick matter, were hindered as to their office of Respiration: For from hence there was a necessity that the Lungs should be swiftly moved, that they might draw the Blood from the heart, and the act of Respiration being more weak by reason of the Nerves being hindered, it became therefore more short and very laborious: A fit of the *Dyspnœa* urging, when as the Blood about the *Præcordia* was very much agitated, the extreme parts (which were then almost wholly wanting) by reason of its absence grew stiff and cold; afterwards when as the Spasms or Convulsions of the Lungs abated, and that the Blood being greatly imbued with the morbidick matter, which it had there sucked up, loosed from its stagnation, was returned to Circulation, that rushing impetuously into her Thighs, first into her left, then into her right, the other being deserted and so

so overflowing its Channels, being extravasated with the serous filth, caused that sudden tumor with the red swelling. But by reason of the shifting of the morbid matter into the more ignoble parts to and again, the Disease though it seem'd very dangerous, easily gave way to Remedies, altering the dyscrasies or evil dispositions of the humors, and gently carrying away the Reliques of the morbid Mine.

Observation.

A Noble Gentleman about 33 years of Age, of a sanguine Complexion as he seem'd to be, tall and slender, of a very sharp wit and great understanding, although he had exercised himself very much for a long time in immoderate and unseasonable studies, together with an inordinate way of living, yet to that time being fresh and full of vigor, he seem'd to enjoy a whole mind in a sound body; a little more than two years before, when he had very much tyred himself in dancing a whole night among his Guests, in the morning going into a cold Bed in a Chamber somewhat moist, desirous of a little Sleep he began to be Sick; for being awaked he fell into great perturbations about the *Præcordia*, with great fainting of the Spirits: After having taken a draught of Wine and some Cardiac Remedies, he was somewhat better; but by and by he relapsed, so that both himself and his friends feared all that day a mortal swooning or an imminent Apoplexy. But after this Assault of the Disease had passed over, he lived after that still obnoxious to daily passions of the Heart, and upon any more great error in living, he was wont again to be troubled with most grievous fits. Notwithstanding the use of Remedies, the Disease increasing upon him within a few Months, it not only infested the *Præcordia*, but in the whole habit of his Body, Suffusions sometimes of cold, sometimes of heat, and besides a *stupor* or numbness, or sense of tingling or pricking, or light and sudden Convulsions or Contractions in his Limbs were excited: And of late besides these Symptoms spoken of already, which although they were very grievous to this Noble Gentleman, yet he was further troubled after a terrible manner with a frequent *Vertigo*, and with distractions and decay of the Spirits, that inhabit the forepart of the Brain, in so much that he was forced to abstain from Studies and Political Affairs (to which he was always addicted) yea and from every more serious intention of the Mind; for otherways he felt those sort of perturbations both in the Head and in the Nervous Stock, that made him fear an Assault of the astonishing Disease, or most horrid convulsive Affections: Whilst he had the more grievous Fits of this Disease, his Ventricle also was disturbed for the most part; but he often received ease by Vomits, either by the free assistance of Nature, or by the help of an emetick Medicine. Hence some thought the cause of the Disease, to subsist altogether about the Stomach or the *Hypochondria*, but Catharticks, Emeticks, Digestive, Cephalick, Anti-scorbutick, Chalybeate, and other Medicines almost of every kind, prescribed him for two years by the most famous Physicians, and also by Empiricks and Quacks, profited little towards the Cure of the Disease. Of late having tried *Astrop* waters, he found himself worse for the use of them, presently desisting, he was next advised to be carried to the sulphureous waters at *Knafborough* in *Yorkshire*, but with what success I have not as yet learned.

This case because by reason of the Concourse of various Symptoms, it can belong to no other kind of Disease besides, is not undeservedly referred to the Scurvy; for it may be suspected that the procatartick or Remote Cause of this Sickness, lay in the evil disposition of the Blood, to wit, that its Liquor was degenerated from a Balsamick and a spirituous, into a sharp and sulphureous-saline, by reason of these Elements being carried up above measure, which indeed seems to have happened partly from Errors in living, for that this Noble Person being often kept by business or more serious Studies even till Midnight, was wont to sup at that time, and presently to go to bed to sleep: Further, this Disease did partly arise from a sickly disposition of the Spleen, and perhaps of the other *Viscera*, supplying the Blood with a morbid ferment, neither is it altogether without reason, that we judge the Spleen should be accused.

The Reason.

The Blood labouring with the aforesaid Dyscrasie, and from thence gathering together heterogeneous Recrements, easily poured the same on the head, being helped by the evident cause: Wherefore when the Brain by reason of immoderate and untimely studies, being something debilitated became less strong to resist the evils, and when for that occasion before cited, the bloody Mass being carried up into a greater ebullition, the pores of the whole Body being by and by shut up, it could not be so well eventilated, its great suffusion or spreading into the head brought

brought on the first manifest sickness, to wit, from the Blood too much heaped up about the Region of the Head, first the swelling, up and *Phlogosis* or inflammation of the Face came: Further, from the same at that time impetuously rushing on the borders of the Brain, and there stagnating the heterogeneous Particles, partly Narcotick; partly explosive, fell down into the Origin of the Nerves, which being so beset with incongruous matter, those perturbations stirred up about the *Præcordia*, (for the Reasons shown in the spasmodick Pathology) did succeed. Further, for as much as the same matter being dilated towards the hinder part of the head, coming upon the Nerves, arising from the spinal marrow, it invaded the extreme passages and processes of them all, and stirred up through the whole Body, a *stupor*, pricking, and the lighter Cramps or Convulsions. Moreover, because the Nerves and their branches compassing about the sanguiferous Vessels, being affected with Convulsions were variously contracted, those sudden diffusions or spreadings of heat and cold, by reason of the Bloods being as it were sometimes restrained with a Bridle, and sometimes agitated forward with a Spur, did arise through the whole Body.

About the beginning of the Disease, because the morbidick matter being suggested from the Mass of Blood, breaking forth first either on the Region of the Cerebrum, or if admitted into the Brain, being from thence presently sent forth, it fixed chiefly about the original of the Nerves, therefore the chief taint appeared in the nervous Appendix, and about its exterior processes without any *Vertigo* or previous swimming or Scotomy, or any notable hurt in the chief powers of the Soul: But afterwards by reason of the dyscrasie of the Blood being daily increased, and the constitution of the Brain or *Encephalon* being more weakened, the heterogeneous Particles also breaking through into the anterior Brain, or the regal Palace of the Soul, they brought on both the distractions and meltings or sinking down of the Spirits inhabiting there: So that this Disease after that its Roots being once planted somewhere within the *Encephalon*, did daily shew its intentions, notwithstanding the use of Medicines, as that at first only the original of the nervous wandering pair, and the intercostal were infected, and then afterwards the morbidick matter entered into the processes and interior passages of the other Nerves of the whole Body, which being filled full, at length that being carried by the as yet impure Blood into the Brain itself, it possessed its more noble Cells, which kind of Cephalick Distempers, I have observed to have made the like progress in many, so that it plainly appears these Symptoms excited by such a *Series*, arise by reason of the aforesaid Causes, and not from Vapours supposed to be elevated from the *Viscera* or inwards.

But that a fit urging oftentimes the Ventricle was disturbed, also that it was wont to be suddenly eased by Vomit, it will not be difficult to shew the reasons without prejudice to this *Hypothesis*. As to the first, there is nothing more plain than that the Ventricle is subverted, and that a nauseousness or Vomiting doth succeed, by reason of some grief inflicted on the Origin of the Nerves, as we have at large already declared, then there is more reason for that Vomiting should bring present help: For in the first place, as the Nerves of the wandering pair and the Intercostal are very much shaken, (as it is the manner of the Nervous Parts) they presently remit their inordinations excited from an internal cause, as an itching or pained member is freed from grief if it be scratched or rubbed. But the aforesaid Nerves being greatly shaken together and contracted in Vomiting, they easily shake off the morbidick Matter, fixed to their ends or extremities; by which it comes to pass, that oftentimes a sharp or acid Matter, or otherwise infestous, being heaped up within the first Passages, and there either infecting the Blood, with its hurtful Ferment, or irritating the nervous Bodies into Convulsions, is brought away by Vomit, and so the Fountain or Provocative of the Disease is carried forth.

As to the therapeutick or curatory Method, to be used in this case, and others like it, there are two intentions which are chiefly to be insisted on, *viz.* In the first place to make pure the Mass of Blood, and to bring away the noxious Ferment administered from the Ventricle, Spleen, and other *Viscera*. Secondly, that the Brain and nervous Stock be strengthened, lest they admit of extraneous Particles: and that the nervous Juice watering those parts, degenerating from a right into acetous or otherwise morbid *Crafsis*, may be rectified and restored. The first of these are to be performed by Catharticks, Emeticks, Phlebotomy, and chiefly by specifick Medicines, correcting the scorbutick Taint of the Blood, or carrying it quite away: But as to this Iron or Vitriolick Spring, celebrated for the purging the Blood,

Blood, that they were rather hurtful than helpful to this Gentleman, the cause seems to be, both for that the Brain being made weak by reason of those Cephalick Distempers, hardly excluded the filth of the Water sent from the Blood, but was in danger to be overflown, by its falling more furiously upon its Confiners; and also because when the nervous Liquor degenerating from its *Crafsis*, turns sour, it is wont to be more perverted by the fluid Salt of those purging Waters. Wherefore we have still observed, that the drinking those Waters, in a Rheumatism and the Gout, hath increased the morbid Disposition. The second intention is best instituted by cephalick Remedies, and chiefly those indued with a volatile Salt, of which sort are Spirits, and Salt of Blood, Soot, and Harts-horn, of the Roots and Seeds of Peony, the leaves of Mistletoe, &c. With which Antiscorbuticks may be mixed.

FINIS.

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